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THE WORK OF VETERINARY OFFICERS, WITH SPECIAL REFERENCE TO THE PRODUCTION AND INSPECTION OF IMPORTED MEAT FOODS*

LIEUT.-COLONEL T. DUNLOP YOUNG, O.B.E., M.R.C.V.S., D.V.S.M., F.R.SAN.I.
LONDON

INTRODUCTORY

When I was asked by Captain McAllan to give an address at this Congress, he suggested that it should be on "The inspection of meat from the import side with the varying methods employed to detect disease and unsoundness."

Mr. McGowan suggested "Food inspection as carried out by a Veterinary Public Health Department."

In order to meet the desires of these two gentlemen, I propose to deal briefly with inspection of foods other than meat first and then devote the principal part of the address to the production, preparation, transport and inspection of imported meat foods. As a paper is to be read on "Milk," I will not touch on that subject.

It is difficult in a short address to treat of all aspects of the great trade done in imported foods. To deal with the inspection of all imported foods other than meat would require a paper entirely devoted to that subject; I must therefore confine my address to meat foods and I hope the lantern slides which will be shown may assist in assuring those who see them that the inspection of meat in the countries of origin is not only equal to but much superior to inspection as conducted in many parts of Great Britain. The descriptions to be given and the slides to be shown are the result of personal observations and not concocted as an advertisement for any country.

FOOD INSPECTION

As a general rule, the inspection of foods other than meat is performed either by an officer entitled the "Food and Drugs Inspector" or by a sanitary officer as part of his multifarious duties.

It is not necessary that he should be a highly scientifically trained officer because the scientific part of the work is performed by that very capable officer, the Public Analyst, whose progress in detecting minute quantities of adulteration, especially in later years, has been most marked. It is necessary, however, that the food inspector should be keen, observant, tactful and well educated, and examining bodies such as the Royal Sanitary Institute have done much to raise the standard of this type of officer just as the Royal College of Veterinary Surgeons has gradually increased the standard of its graduates educationally and scientifically.

The food inspector should have good eyesight and a keen sense of smell. He should be able to recognise at a glance the various types of food he has to control with their normal and abnormal conditions, know the names of the various fishes and their seasons, and possess a good knowledge of the various Acts, Rules and Regulations dealing with foods and how to procure, according to law, samples intended to be submitted to the Public Analyst. It is a very common question to candidates for the food inspector's certificate, "Why does the inspector divide his purchases into three parts?" and as the third part is rarely brought into use candidates often fail to give a satisfactory reply. To those who do not operate this part of food inspection it may interest them to know that the three parts are utilised by one part being given to the seller so that he can have it analysed by his analyst, one part is handed to the Public Analyst and the third part is reserved to be submitted to the Government analyst *if the two previously mentioned analysts disagree.*

The duties of a food inspector have been greatly increased lately, due to the introduction of the marking of meat and requirements under the Merchandise Marks Acts. A good inspector does much useful work by tactfully warning those who unintentionally in person or by the carelessness of employees fail to comply with the law.

The advice of Dr. Russell, the late Medical Member of the Local Government Board for Scotland and at one time Chief Medical Officer of Health for Glasgow, whom I had the honour to serve, was: "Public health officers should be educationists and not policemen; do not stand aside and see men break the law, advise them not to do it and then if they do, they must be punished." Whatever success I may have

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attained in public health work has been due in a great measure to following the wise advice of that eminent medical officer, and I pass it on to others for their benefit.

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The Work of Veterinary Officers in the Production, Preparation, Storage, Transport and Inspection of Meat Foods

It appears to be the opinion of some people, even those who should know better, that any person can, with a short course of training, become a so-called qualified meat inspector and that the veterinary officer is not necessary in this branch of public health work. As one who has devoted many years of his life to meat inspection at home and abroad, I am glad of this opportunity to controvert such a fallacy and in order to do so I desire to begin with :

Breeding and Feeding of Animals (*a*) In this country ; (*b*) Abroad

(*a*) *In this country.*—The veterinary surgeon is the guide and friend of breeders and feeders of all classes of stock from the time animals are born, through the period of feeding, including the testing for disease with a view to granting the necessary certificate for export, supervision while in the quarantine station and arranging for suitable transport overseas.

(*b*) *Abroad.*—The veterinarian receives the animals into the quarantine stations, retests them and issues a certificate of freedom from disease before the animals can go to their final destination. On the estancios or ranches he endeavours to prevent disease arising amongst stock and eradicates disease such as tick fever and anthrax. No cattle can be sold to the meat works without having been examined by a Government veterinarian and a certificate of freedom from contagious disease granted by him prior to the movement of the animals—this is a legal necessity in South America.

On arrival at the Meat Works, the animals are again examined by veterinary officers and any doubtful animals are at once placed aside and slaughtered under special supervision. If contagious disease is discovered, it is at once reported to headquarters, who at once notify the veterinarian in charge of the district from whence the animals came and no animals can be moved from that district until it is declared free from contagious disease.

Slaughter of the animals in the Meat Works cannot begin until the veterinary staff is present and must cease when these officers, by arrangement with the Works Manager, stop work ; not only so, but the chief veterinarian can control the speed at which slaughtering is being done if he thinks animals are killed quicker than his staff can properly examine the carcases and organs. The whole of the works from a hygienic point of view are entirely under his control, including the purity of the water supply, lavatory accommodation and even the health of the employees in that, if he observes anything suspicious as to the health of an employee, he sends him to the Medical Officer to be thoroughly examined and will not allow him to recommence work, if he is handling foods, until the doctor certifies him as suitable to do so. All carcases, offal, canned meats, lard, premier jus, sausage casings, cold chambers, meat holds in ships and everything in connection with meat and meat products are under veterinary inspection.

All meats and meat products must bear evidence of veterinary examination in the form of stamps, or labels, to the effect that they have been prepared under Government supervision and it is to the credit of those officers that "considering the large quantities of meat imported, very little evidence of disease is discovered in the meat in the importing countries." In this country occasionally a carcase may be found to contain a lesion of disease but to those who know the number of animals handled daily—in one meat works, for example, 10,000 sheep or 5,000 cattle or 8,000 pigs—it is easily understood that a carcase may pass unobserved while an inspector's attention has been called to something else, or a rejected carcase may accidentally be passed on to the export rail. I desire here to pay tribute to the majority of public health officers in Great Britain for their fair judgment in necessary action when they find such a carcase ; they realise that 100 per cent. perfection is unattainable even under the best system of meat inspection.

In most of our large towns, the chief meat inspector is a veterinarian who has devoted the greater part of his life to public health work and as a general rule, he is in possession of a diploma in Veterinary State Medicine indicated by the letters D.V.S.M. A whole year's special training in the veterinary department of a local authority associated with special training in a veterinary college laboratory is necessary to obtain this essential qualification. The basis of real meat inspection is that not one pound of meat which is fit for human consumption should be destroyed and not one pound of meat which is unfit for human food should be passed into consumption. This is only justice to the owners of animals and essential to the health of the public.

The National Federation of Meat Traders has always pointed out that it does not object to meat inspection, but desires it, if conducted on the afore-mentioned lines.

It must therefore be obvious that to secure such efficiency the officer in charge of meat inspection should have a complete knowledge of animals in health and disease, the symptoms of illness, what they indicate, be able readily to recognise the *post-mortem* appearances of the

various diseases and with his training in physiology, anatomy, pathology, bacteriology and parasitology, to decide whether lesions observed indicate a local or generalised disease, and as a result whether to confiscate the whole carcase and organs or only part of the carcase and/or some of the organs.

In the opinion of such well-known authorities as Sir John McFadyean, Professor von Ostertag, Professor Leighton and Professor Symmer of Belfast, the work referred to above should be carried out either by or under the supervision of specially trained veterinarians; medical officers of health fully recognise this and many have advised that the recommendation of the departmental committee on meat inspection with reference to the duties of expert meat inspectors being carried out by the veterinary inspectors of local authorities, should be adopted. To those medical officers we tender our thanks and assurance that we will work loyally with them in guarding the health of the public in the supply of sound meat and pure milk for human consumption.

It is recognised that it is not always possible to have a complete staff of veterinary meat inspectors and therefore trained lay meat inspectors must be employed as assistants and colleagues. While it cannot be expected that those officers who have not undergone years of scientific training, can understand all the pathological essentials in a degree equal to a medical or veterinary officer, yet many of them make excellent officers, being keen and very observant. I have generally found that those who have been trained as butchers or had experience of livestock, make the best officers. As justification of this opinion it is worth noting that one of those officers lately discovered the larvæ of *Hypodermis bovis* in the spinal canal of the carcase of young cow and another officer discovered lesions of tuberculosis in a sheep.

MEAT INSPECTION IN GREAT BRITAIN

In Scotland, so I understand from Professor Leighton, about 90 per cent. of the meat consumed in that country is prepared in public abattoirs. In England, and I believe I am right in including Ireland, a large percentage of the home-killed meat consumed originates from private slaughterhouses in which there is not always a satisfactory system of meat inspection, and in fact this is one of the points upon which countries from which we receive much of our meat remark, namely, that our imported food regulations are so very strict yet the inspection of home-killed meat is in many cases very lax. This is no doubt due to slaughterhouses being situated far from each other and the lack of sufficient meat inspectors. In some districts many of these places exist in which animals are killed at all hours, and there may be only one inspector available in the district whose multifarious duties prevent him from inspecting all the carcases and organs of animals killed.

From an inspection point of view public abattoirs are the ideal to be aimed at, but there is a danger that if butchers are forced against their will to use public abattoirs, they may be inclined, to avoid any trouble and inconvenience, and to purchase what they require in the dead meat market; this may result in their buying the excellent meat imported from overseas to the detriment of our breeders of home stock. It follows that the question of centralised slaughtering, as at present suggested, requires very careful consideration.

Improvements could be effected by the appointment of additional meat inspectors who, with a small car or motor bicycle, could visit many slaughterhouses. I take again the opportunity of advocating what I have so often urged—that all meat, especially if it is to be sent into the area of another local authority, should bear the stamp of the inspector of the area in which the animals are slaughtered.

Imagine meat from Aberdeen, Glasgow, Edinburgh, Manchester, Birmingham, Belfast or Dublin, where efficient staffs of meat inspectors are stationed, arriving in Smithfield Markets, London, having to be re-examined because it does not bear any indication of having been examined at the place of slaughter. Lately, owners of meat have been prosecuted and fined for having sent into another area, meat which was actually examined and passed by a meat inspector at the place of slaughter. If such meat had been stamped, the onus would, as recommended by the departmental committee on meat inspection, have fallen entirely on the meat inspector at the place of origin and not on the owner of the meat. I submit that a resolution to the effect that all meat should be inspected and stamped, be proposed at the close of this Congress and that, if carried, such resolution should be forwarded to the Ministries of Health of England, Scotland and Ireland.

Having endeavoured to show the necessity of properly trained meat inspectors and the importance of veterinary surgeons in connection with meat inspection, I now direct attention to what Captain McAllan desired, namely, the method of inspecting imported meats. It is necessary to remember that all imported meat foods have, as already explained, been examined at the places of slaughter and certified as free from disease—shown by means of labels or stamps on the meat. This assists in a great measure the inspectors in the country of importation and it is very essential because it can be readily understood that it would be practically impossible to examine every carcase in a consignment of 30,000 carcases of mutton; further,

there are no organs attached to the carcases and judgment of carcases *minus* organs is never so reliable as judgment at the place of slaughter when all the organs are available.

We have therefore to proceed on a percentage basis of examination; as a general rule, this is one of 5 per cent. except in small cuts of meat which may be 100 per cent. A small percentage of errors is allowed, generally under 2 per cent; if this figure is not exceeded at the port examination, the cargo is allowed to be sent to its destinations uncontrolled, but if over 2 per cent. errors are found, then the cargo will be sent forward "under stop," that is, the meat is deposited in cold stores in the destination area, but must not be removed therefrom until it has been examined by the Public Health officer of the district. This method applies to carcases, offals, rabbits and all classes of meat foods. The customs officers note if any meat foods do not comply with the Import Regulations; if they do not they notify the Port Medical Officer of Health who can at once place a stop on the cargo. If on examination he finds it contains diseased meat, he can seize such meat, but if it is free from disease and simply does not comply with the regulations, he cannot seize the meat but can give the agents the option of re-exporting it or surrendering it to be sold for commercial purposes.

For examination purposes, it is usual for the inspectors to watch the carcases or quarters come out of the holds and to observe any blood stains on the stockinette coverings, or misshapen carcases, both of which are indications of change of temperature having taken place on board ship—during which time the partial thawing has caused the colouring matter or hæmoglobin of the blood and tissues to stain the covering, and the weight of the upper layers of the carcases presses the softened carcases of the lower layers out of their natural shape: carcases of sheep, lamb, pigs and calves are generally packed in layers in the holds extending from floor to roof; chilled meat is carried in the hanging position and at a temperature of 29° to 30° F., while frozen meats are always carried at a temperature below 18° F.

Changes of temperature not only produce what has been described, but induce the growth of moulds, which grow quickly if the temperature of the hold rises above 18° F. Lower temperatures do not kill but only inhibit the growth of the moulds. It is worthy of note here that the introduction of about 10 per cent. of CO_2 into the holds carrying chilled meat seems to inhibit the growth of moulds, and chilled meat is now being carried by this method from Australia and New Zealand, but the essential feature in conveying all meats, chilled or otherwise, is good hygiene, perfectly applied in every detail from the slaughter of the animal until the meat is on the consumer's table.

Only a few years ago all the chilled meat we received was derived from Argentina; now we receive chilled beef from Argentina, Uruguay and Brazil in South America, Australia, New Zealand, Canada, Southern Rhodesia and the Union of South Africa.

In connection with the question of hygiene, we have much to learn from some of the meat works, especially with reference to the washing or wiping of newly-dressed carcases. In the majority of these works, the water used in washing is derived from special tanks fitted overhead from which clean water is constantly flowing through a metallic tube and a spray brush is used to clean the carcases, instead of the method still common in use in many slaughterhouses whereby a cloth is used to wipe not one, but many carcases during the day and the water, instead of being always fresh and clean, is simply added to when required.

In looking for moulds at the port of entrance, numbers of carcases may be unsheeted. Moulds generally consist of the so-called white and black varieties; the former can easily be wiped off the meat because the hyphæ grow in the vertical direction, but in regard to the latter, the meat has to be trimmed as the hyphæ grow between the fat cells in the horizontal direction. When the temperature rises over 18°, these moulds are apt to grow rapidly until the temperature reaches over 30° F., when bacteria, if present, begin to grow, and we then observe a slimy condition of the meat rendering it unsuitable for human consumption.

Diseases: Regarding diseases, those looked for in imported meats are generally:

In Ox Tongues.—Evidence of tuberculosis, actinomycosis, actinobacillosis in the submaxillary lymph glands.

In Beef.—Lesions of tuberculosis may be found in the deep-seated lymph glands, *e.g.* precrural, ischiatic, popliteal and prescapular. At one time, the parasite *Onchocerca gibsonii* used to be found in the connective tissues of the sternum and around the stifle joints. It is not necessary to look for the parasite now as the inspection is so good at the places of slaughter. Occasionally isolated cysts of *C. bovis* are found but they are extremely rare. Bone taint is now very rarely observed. To those unacquainted with this term, it may be explained that it is decomposition of the tissues surrounding the acetabulum of the hip joint, rarely the shoulder joint, set up by bacteria gaining access thereto and multiplying while the temperature is favourable to their growth. At one time, it was thought the condition was due to placing the carcases into the cold chambers before the natural heat had evaporated from the carcase; it has now been proved that the carcases cannot be too quickly cooled down, and the cold chambers are filled with sides of beef as soon as there are sufficient available to fill the chamber.

The temperature of the empty chamber is generally under 30° F. when the meat is put in, and after the chamber has been filled, the temperature will rise to about 45 to 50° F. In order to prevent bone taint it is necessary to have the temperature down to at least 35° in 24 hours, the aim being to have the temperature at the joints quickly lowered so that bacteria do not find a suitable habitat for their growth.

In Pork.—Tuberculous lesions may be found in the sub-maxillary lymph glands or, if the head has been excised, lesions may still be found in some of the cervical lymph glands of which there are large numbers in the pig. *Cysticercus cellulosæ* are practically never seen and Sarcosporidæ very rarely. Occasionally the kidney worm *Stephanurus dentatus* may be found.

In Mutton.—Rarely, *Cysticercus ovis* is found and then it is generally in lambs, but so seldom as to be negligible. Caseous lymphadenitis was at one time not uncommon; to-day it is very rarely seen, and considering the numbers of carcases imported this fact reflects great credit on the veterinary inspection overseas. If looked for, the principal lymph glands to examine are the superficial inguinal, supramammary, precrural, and prescapular. Odours absorbed in transit are not uncommon, *e.g.*, derived from citrous fruits, creosote, etc.

Offals.—These consist of the various organs of the food animals and are generally very free from disease and so packed that they are easily examined.

Rabbits.—These arrive in the frozen condition and generally they are free from disease. When anything is wrong with them, it is as a rule a question of condition due to over-long storage, oxidation of the perirenal fats—that is, a very yellow condition of the fat—or improper care in the packing of the rabbits at the time of freezing. Coccidiosis is very rarely observed.

Boned Meats: These generally consist of beef, veal, etc., carried in the frozen condition and it is necessary, for careful inspection, to have a percentage defrosted. Lymphatic glands and serous membranes should be present although drastic action should not be taken if parts of the membranes have been accidentally taken away or where the costal pleura has been removed in the boning out. Intercostal pleura must be left *in situ*.

Tinned Foods

The examination of tinned foods requires practical experience. In cases of suspected preservatives or metal absorption the public analyst is the deciding officer. As veterinary surgeons, not acting as public health officers, may be called to examine tinned foods, a few hints may be useful to them. To be well acquainted with tinned foods, it is necessary to have had experience in the method of "processing." Very briefly, meat is pickled, partly cooked, cut into small pieces, then stuffed into cans by means of a stuffing machine; caps are soldered on, having a small central hole left in them on which is lightly placed a small dab of solder. The tins are fed into a vacuum sealing machine which has a pressure of 20 to 25 inches on the gauge. By special arrangement, the central hole is sealed. The tins are then placed in a steam retort; this is called "processing." The temperature is about 190° F. and the time about 4½ hours. For better sterilisation, the tins can be put into the retort first and the hole soldered later. Completely to sterilize the contents a temperature of 240° F. for 15 minutes would be required, but that temperature would melt all the fat. The processing causes the tins to become convex; this is counteracted by placing them under a stream of cold water which causes them to become concave at the ends. The vacuum process withdraws oxygen, in which ærobic bacteria grow. The tins are then lacquered, labelled, stored and examined later prior to shipment in order to observe any defects; defective tins are at once rejected.

Methods of Examination: These consist of Inspection, Palpation, Percussion, Shaking, Auscultation.

Inspection.—Look for holes, indentations and damage due to bad handling, also rust; if the latter is slight it is not of much consequence but it may have eaten through the tin and so we get what is called a "leaker." "Blowing" indicates decomposition or fermentation. "Bulging" should not be mistaken for "blowing," as it is generally due to overstuffing.

The number of vent holes is not a definite sign of trying to pass unsound foods. Dr. Savage, the well-known medical authority on the subject of tinned foods, states: "Contingencies may arise which make it legitimate to make a second hole."

Palpation.—Feel for springiness; a "springer" or "flipper" indicates vacuum lost and gas present, but may be due to insufficient filling.

Percussion.—Tapping the surface of the tin, using the fingers or a piece of wood. If the contents of the tin are good, you get a dull note; if gas be present, a tympanic sound is produced: this may be in one part of the tin only or all over it. A tympanic sound may be due, however, to insufficient filling, and when in doubt it is advisable to open one or two tins.

Shaking.—If a liquid sound is present in meat tins, the contents may be bad, but not always, as some liquid may be left in the tin to keep the meat from being too dry. If you have an excess of moisture, you get what is termed a "sloppy." In fruit canning, such as loganberries, there may be fermentation with gas formation and yet the contents of the tin may be quite good.

Main defects.—These are generally under-sterilization and defects in the cans or tins, *i.e.*, defects in the quality of the tin, in the sealing and the filling. In all doubtful cases, it is advisable to open a few of the tins.

Food Value of Imported Meats

It has often been asserted that the food value of imported meat is very much lower than that of home-killed meat, and analysis published to prove such an opinion. I have lately been associated with tests made to ascertain the truth or otherwise of such opinions, and the following table shows the results as ascertained by a most reliable firm of analysts.

Average	Best home-killed beef	Best Argentine chilled beef
Gross loss of weights of joints	24.5	25.7
Nett loss of weights of joints	14·6	15·1
Undigested matter ..	19·6	19·3
Mineral matter	1·07	1·12

In the words of the analysts, "the differences found are so slight that it would be safe to say that meat from both sources is equally economical quite apart from price."

The same firm of analysts, through the kindness of Sir Gordon Campbell, made a test of frozen beef which had been kept in cold stores for 18 years. The results were stated as follows: "During the long time of freezing, bases have formed but culinary feeding experiments with human beings have proved that any such changes have not made the meat unpalatable or unwholesome."

	English beef	New Imported frozen beef	18 years old frozen beef
Total Nitrogen ..	12·7	13·0	11·9
Nitrogen in Extractives ..	7·1	6·0	6·2
Nitrogen in Proteids	5·6	7·0	5·7
Soluble Proteids..	43·2	48·0	44·5
Albumoses ..	41·3	47·7	47·4

In general, the examination of imported meats is most easily conducted in markets when the meat is being cut up into joints and unsheeted prior to sale. In a large market such as Smithfield Market, London, the inspection is controlled by a staff of officers who have sections under their supervision. The officers are changed from section to section every six months, thus gaining experience in all classes of foods and becoming very efficient. Every endeavour is made to work in close co-operation with the meat traders. At one time I found the traders looked on meat inspectors as detectives looking for evidence to secure a case for prosecution and conviction; gradually these ideas were tactfully eliminated, and now the traders regard the meat inspectors as friends who assist them in keeping out of trouble by withdrawing from sale anything that may cause trouble to the retail butcher later and eventually recoil on the wholesaler and I desire to testify once again that the inspection in the great market of Smithfield could never be so carefully done if the meat inspector had not the loyal assistance of the meat traders.

Meat inspectors should always remember that the owner of a carcase may have purchased the animal in an open market at a high price and it is hard for him to have only the hide left out of such a transaction when even you, with all your practical and scientific training, might not have been able to detect anything abnormal about the animal. I therefore strongly advise young inspectors to know their work thoroughly, to be always anxious to learn, to be tactful and firm but always just. If a trader asks to have a second opinion always agree, for if you prove to be right, your reputation will be enhanced, and even if you have made a mistake, the trader will say you are not too proud to have another opinion and even admit your error. To be expert in meat inspection requires experience and practice; you cannot all have that experience, but to practitioners who may be called to examine carcases and give certificates as to fitness for food, I recommend that they pay great attention, not only to all organs and their associated lymph glands, but to the carcase itself, systematically examining it superficially, *i.e.*, all joints, vertebræ, sternum, serous membranes and kidneys; the kidneys should be withdrawn from their fatty capsule, carefully viewed and if necessary returned to their normal position. The principal body glands should receive careful examination, *e.g.*, superficial inguinal or supramammary, precrural, ischiatic, iliac, lumbar, renal, posterior mediastinals (which may be left embedded in fat under the vertebræ in front of the kidneys), the prepectoral and the prescapular. It may even be necessary to examine the popliteal, dorso-costals and supra-sternals. There is nothing more vexing to a public health veterinary inspector than having his attention called to a carcase which has been certified by a member of his profession and finding that the deep-seated lymph glands have not been incised, and that after incision, lesions of disease are found therein. In the examination of pig carcases where evidence of disease appears to be confined to the sub-maxillary lymph glands, and the head is taken off, it is very necessary to make sure that all cervical lymph glands are incised.

I suggest once more that refresher courses in

meat and milk inspection should be a regular feature of all our veterinary colleges. Such courses need not be of long duration and they should be conducted by veterinary officers who are daily engaged in carrying out public health work. By so doing every veterinary surgeon, even if he qualified in the days when less attention was given to meat and milk inspection, will become familiar with present-day practical methods of protecting the public from eating unsound food or drinking impure milk. All veterinary officers conducting meat and milk inspection should be supplied with suitable laboratory requisites in order to carry out quickly microscopic examination of suspected material such as anthrax, etc., so that detection may prevent the spread of disease to man and animal. The cost of supplying a laboratory and its requisites need not be very great, and cost should not be considered where the health of the public and the spread of disease are under consideration.

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Major W. J. B. DeVine (Birmingham) presided (in the absence of Mr. F. J. Daly, the President of the Public Health Section, who was unable to be present) over a large attendance in the Physics Lecture Theatre, Queen's University, Belfast, on the morning of Friday, August 2nd, when the above paper was discussed. The Chairman called upon Colonel Young to introduce his paper and to show slides in illustration.

Colonel Young said that he presumed they had all had a copy of the paper, and therefore they might take it as read.

With a view to assisting him in bringing the great romance of that great imported meat industry before them, he had thought it advisable to bring with him some illustrations. He then proceeded to give his lantern lecture, which was of great interest and much enjoyed.

The slides comprised pictures illustrative of the various breeds of cattle and sheep in the Argentine. In this connection it was interesting to see the highest priced Shorthorn bull ever sold—and it is in the Argentine—no less a sum than £13,000 being realised for the animal.

Speaking of the Southdown sheep, Colonel Young expressed the view that, in consequence of the modern demand for small joints, Irish breeders might well consider substituting a Southdown-Romney ewe cross for the prevalent Blackface.

A number of slides was shown indicative of types of beef and mutton carcases, varying from the uneconomic to the ideal.

The pictures next demonstrated methods of combating disease—dipping, etc.—also transport of animals, and *ante-mortem* and *post-mortem* inspection.

Next came the meat works processes, and slides illustrative of "The Romance of the Great Meat Industry" in America, not omitting the cold storage, by-product, and meat transport departments.

Finally, the meeting was much interested in a series of comparative slides showing conditions in Smithfield when Colonel Young went there and those existing to-day.

Discussion

Major Brennan DeVine (Birmingham) who opened the discussion, said:—

At the request of Mr. McAllan, I am honoured to take the place of Mr. Gofton who, unfortunately, cannot attend owing to illness. I hope that his illness will prove but a short one, as I am sure his absence from this great Congress is felt very much indeed and his absence from this particular discussion is a great loss to the members attending here. (Hear, hear.)

I congratulate Colonel Young on his paper in dealing with the subject of the production and inspection of imported meat. Colonel Young holds a unique position in the veterinary profession. He is the most widely travelled of all the members of the veterinary profession engaged in public health in this country. His personal visits to other countries which send meat to the United Kingdom give him a greater right to deal with the subject of imported meat than any other member. What he has to say on the subject is actually based on personal experience gained in the exporting countries.

In his introductory remarks he says that it is not necessary that an inspector of foods other than meat should be a highly scientifically trained officer, because the scientific part of the work is performed by the public analyst. That is a general remark and when examined in detail I can scarcely agree with it. I am sure the essayist would agree that if foodstuff is to be examined it would be an advantage for the primary examination to be carried out by a scientifically trained officer.

In speaking of the increase in the duties of the food inspector, he refers to the introduction of the marking of meat and the requirements under the Merchandise Marks Acts. There are many more Acts and Orders than those, which have of recent years influenced to a very great extent the increase in the work of food inspectors. Among other Acts and Orders, the Meat Regulations of the Ministry of Health and the various Orders of the Ministry of Agriculture have, to a considerable extent, largely increased the work of those inspectors.

I agree with Colonel Young that an inspector can carry out his work efficiently and conscientiously without acting continually as a detective

or a policeman, and by giving good advice to those in the trade, he can more assuredly obtain the object—that of placing good food before the consumer and working amicably with those engaged in the meat trade.

Veterinary meat inspectors, like other inspectors, suffer from criticism of the man in the street and even from members of the local authority who do not understand or appreciate the work which has been carried out. The fact that untrained men have from time to time in the past been appointed inspectors of food has originated the idea that such work can be carried out by men without much training, whereas in order to produce a capable inspector, scientific, as well as long practical experience is most essential.

We have come to recognise now that food inspection is a most important and highly skilled branch of veterinary medicine and surgery, and for that reason special post-graduate degrees have come into being for men who wish to become public health officers.

As Colonel Young has visited so many places abroad he is able to give us first-hand information of the conditions which exist in those countries sending meat to England, and the pictures he paints of the inspection in those places leave very little to be discovered in the way of improvement of the inspection of the carcases, but nevertheless I feel at the back of my mind, that "faraway cows have long horns."

I have often read descriptions of what takes place in various large cities in the world and I myself have personal experience of the abattoirs in practically every European country. In those places I have visited, accompanied by members of my local authority, many of the conditions were stage-managed for our visits. In Denmark, Germany, Belgium, France, I have gone into the slaughterhouses and found ideal conditions; yet on previous or subsequent visits, when I have called at these places and found them at their ordinary work with no previous notice being given, the conditions were not always ideal. I must say I was rather surprised, visiting some slaughterhouses in America, to observe the celerity with which the work was carried out. The organisation as regards celerity of output and reduction of labour costs to a minimum in those places seemed to be perfect, but, at the same time, there were possible loopholes whereby diseased meat might escape notice. Colonel Young tells us of the slaughter of animals in the meat works abroad under control of the veterinary staff who also control the purity of the water supply, the lavatory accommodation, the health of the employees and the manufacture and handling of the by-products, and he suggests that inspection under veterinary surgeons in those countries is ideal: I would remind you that the same conditions hold good at the Islington slaughterhouse, which is under the control of Mr. Hayhurst and, indeed, in my own town the same conditions apply. It is not necessary to go abroad to get examples of such organisation.

One good thing which is carried out by the meat exporting countries is that they stamp all meat which has been passed for inspection. This is an admirable procedure as it saves our portal inspectors in this country a lot of work, and I quite agree with Colonel Young that it would be desirable that meat which is passed in one district in this country by a meat inspector should be stamped and then the inspector in another district, where the meat is being offered for sale, would know that it had been previously examined and passed.

Colonel Young states that there is very little evidence of disease discovered in the meat received here from other countries. Any of us who are engaged in the inspection of imported meat here must agree with him on that point, and I consider that it is in no small way due to Colonel Young's great work in visiting meat-producing countries, that this has been carried out. I would refer particularly to the sudden and effective reduction in the number of mutton carcases affected with caseous lymphadenitis. I think the exclusion of this disease from imported mutton is due principally to the work which has been carried out in recent years by Colonel Young whilst employed at the Smithfield Market in London. (Applause.)

Similar good work was performed some years ago in connection with imported Australian beef affected with Onchocerca. We occasionally come across cases of lymphadenitis, but not often. We rarely see a carcase affected with Onchocerca.

If I might quote from Colonel Young's address, there is one dictum which I would ask all young public health officers to impress upon their minds: "The basis of real meat inspection is that not one pound of meat which is fit for human consumption should be destroyed and not one pound of meat which is unfit for human food should be passed into consumption. This is only justice to the owners of animals and essential to the health of the public."

In referring to the National Federation of Meat Traders, he mentions that they do not object to inspection. I agree with him on that point and I know that the meat traders are only too willing to have inspection, provided the inspector thoroughly knows his job, as they have had experience in the past of suffering through the lack of knowledge on the inspector's part.

Scotland has always been in the forefront to act as a good example for her neighbour England and as Colonel Young states, 90 per cent. of the meat consumed in that country is prepared in public abattoirs. We must admit that there is

a great lack of public abattoirs throughout England. Many of the large towns obtain their home-killed meat supply from private slaughterhouses. I agree that the regulations in this country in connection with imported meat are much more stringent than those applying to the home-killed meat, but after all, the home-killed meat we have on the spot and can deal with directly; in addition to that we have the great help of having the internal organs to examine with the carcase. The imported meat is inspected under Government regulations, whereas home-killed meat, more or less, is controlled by local bye-laws and the meat regulations issued by the Ministry of Health.

I agree with the resolution suggested by Colonel Young, that *all* meat should be inspected and stamped, and that such resolution should be forwarded to the Ministries of Health of England, Scotland and Ireland.

In the examination of imported meat, we receive in Birmingham notices from the portal authorities stating that meat has been forwarded subject to examination. When such meat arrives we invariably examine 10 per cent.; if any disease is found amongst the 10 per cent., we examine 100 per cent.

As regards rabbits, we rarely have any complaint to find with respect to imported rabbits, except in cases where rabbits are taken out of cold stores and thawed out. They then arrive at temperatures at which bacteria will grow and if they are returned to cold stores and again frozen, the rabbits may be in an unfit condition, owing to decomposition, while the condition is clothed by the freezing. This unfortunate and undesirable condition might be overcome by regulations insisting that if rabbits are once de-frosted, they should not be returned to cold stores.

As regards moulds on meat, these cause the meat to become, in many instances, unmarketable. I am always suspicious of meat which is affected with mould, not because the meat was necessarily diseased at the time of slaughter, but because of the possibility that the cold storage has broken down on the ship or elsewhere and decomposition may have been set up in the meat whilst such breakdown occurs.

The great amount of research work which has been carried out in connection with imported meat, enables such faraway countries as Australia to send us now chilled meat. It took many years of work and investigation to acquire the necessary conditions for putting on the London market chilled meat from Australia. After a journey of 23 to 25 days chilled meat stored in ship at a temperature of 28° to 29°F. is in good condition and may be kept in excellent condition a further ten days in this country if the meat is stored in air containing carbon dioxide, the CO_2 materially inhibiting the growth of the moulds; owing to our recent knowledge in this respect we have during the past year been receiving meat from New Zealand. Such work, of course, must necessarily increase and cheapen our food, but is to the detriment of the beef-producing agriculturists in this country.

As regards hygiene in slaughterhouses, the washing of various carcases from a tub of water with the same cloth is most undesirable and is certainly detrimental to meat which is to be kept at an ordinary temperature for several days. Clean water, applied under pressure to each carcase, without the rubbing of a cloth, secures much better-conditioned meat.

Efficient prolonged storage of meat depends to a great extent on the prevention of bacterial infection at the slaughterhouse.

Dealing with the diseases to be looked for in imported meat, Colonel Young deals with bone taint. Opinions vary as to the origin of bone taint, but I have always held the opinion that bone taint is due to inefficient bleeding of the carcase, blood being left in the larger blood vessels in the hind quarter round about the hip joint and consequently bacterial growth takes place there at suitable temperatures. The principal cause of this lack of complete bleeding is the slaughtering of animals with free bullet instruments. Filling the cold chambers with warm carcases raises the temperature so suddenly that unless special precautions are taken, chilling and freezing chambers are often at a high temperature for 24 hours after they have been filled with warm carcases.

In connection with the examination of pork, Colonel Young speaks of *Cysticercus cellulosæ* and *Stephanurus dentatus*, but he makes no mention of a parasite which is not so rare as is generally supposed; I refer to the *Trichina spiralis*. In the past few years we have had several cases in our local hospitals of people being affected with trichina. In spite of prolonged investigation, we have not been able to trace the origin, but in nearly every case there is a history of some imported meat being eaten. *Trichina spiralis* is common in Eastern Europe. We receive pork from Poland and other countries where the parasite is prevalent; therefore it is not surprising that occasionally we get outbreaks of human beings being affected with this parasite. When I visited Germany a few years ago I found in the laboratory at Hamburg a staff of 30 people engaged on no other work but examining for *Trichina spiralis*, while at the public abattoir at Berlin, there was a staff of 80 people carrying out the work.

Although Colonel Young does not seem to emphasise the necessity for carefully examining imported boned meats, I am of the opinion that such meats are unsatisfactory to examine, particularly where the pleura has been removed and if there are no lymphatic glands present: it is undoubtedly difficult at times to give a decision as regards such meat.

It is a curious thing (proceeded Major DeVine), but heredity is influenced by local environment, and if we continue with our breeds we shall eventually get local characteristics, and, in order to obtain the best type of the Hereford, breeders in other countries are compelled to come back to Herefordshire to get something from the original stock to maintain the true type.

As regards the breed of sheep which Colonel Young has seen in the North of Ireland, the essayist suggested that they might use some of the New Zealand breed. I do not think it popular propaganda to suggest bringing the New Zealand here for breeding purposes, I would rather see it recommended the other way. As a matter of fact, if the North of Ireland people want something for the mountain, they can get good foundation animals in Wales. I always eat home-killed lamb; it is as good as any in the world, and if they could produce that in the mountains of Mourne and round about, they could produce the best, and for the good land—the low-lying places—a cross with the Southdown, or even the Cheviot, is suitable for the London and other great markets.

Speaking of the animal that was tested five times with the subcutaneous test, I am surprised that the animal failed the subcutaneous test. I used to do a lot of the subcutaneous test for tuberculosis, and possibly the animal was tested to death: it got so immune that they did not get the reaction they expected—but if they had given the animal a rest and increased the dose of tuberculin and taken the temperature from the second up to the sixth hour, possibly they might have got some surprises and retained their faith in the usefulness of the subcutaneous test.

Colonel Young has said that in South America cattle are bought from £3 to £3 10s.: I would take him across the river here (in Northern Ireland) and get them for the same price.

The essayist has spoken of New Zealand mutton as being the ideal size. I could guarantee that they could get certain breeds in this country, and when the animals were put into cold storage they would have the fat in the right place and the lean in the right place. They have some extraordinarily good breeds in this country, but they are so confined to certain areas that we do not see the bulk of them, and so we forgot about them.

As regards the future of the function of the veterinary surgeon in this regard, I agree that, generally speaking, the work done in connection with meat exported to this country is very good indeed. Nevertheless, we get outbreaks of disease in this country, and there is quite a suspicion, with a reasonable foundation, that some of these are due to imported meat, particularly from South America, and I dare say that if it extended for some time, the inspection would tighten up in South America. We would like to see our country free from those scourges from South America that sweep the country and cost so much.

I hope that as great a number as possible will take part in this discussion, and give their experience of the various aspects treated by Colonel Young. (Applause.)

Lieut.-Colonel J. A. Dixon (Leeds), who was the next speaker, said that he would like to explain that it was merely an act of obedience to their esteemed President that he appeared before them that morning. He had not intended saying anything, because there was so very little one could disagree with in the remarks of their essayist or their Chairman.

Colonel Young's paper was indeed very interesting, and he thought his review and his very lucid explanation of the development of the imported meat trade was particularly interesting, and that they were greatly indebted to him for reminding them of their position in that great industry.

He had read the paper with care, and he thought the item which attracted his attention most was Colonel Young's suggestion of the marking of meat carcases. At one time it was hoped that the Public Health (Meat) Regulations would lead to a widespread activity in that respect, and no doubt many of them were disappointed at the very, very meagre results from those Regulations, and, as was the case in many other instances, he thought the lack of interest in that subject arose largely from the fact that meat marking could only depend on the whim of the butcher. There was nothing compulsory about it.

The marking of meat passing from one area to another would be of very great advantage in this country irrespective of the marking of imported carcases. In the industrial areas there was a constant traffic in meat, particularly from larger cities to urban districts. Frequently it happened that unsatisfactory meat had been found in markets of urban districts, and it was stated that the carcase had been obtained at the nearest large town, and in the absence of marking and in the presence of a receipt from a wholesale butcher, it was very difficult to disprove the statements, but in one or two instances they had been able to prove that the meat in question had not been produced at the large town, but had been obtained from other and less reputable sources, and if they were to ensure that all carcases that were being passed from one area to another should be marked, it would be more satisfactory to the butcher and far more satisfactory to the officers concerned.

Whilst he agreed with Major DeVine's observations on the demand that the inspection of meat should be carried out by properly trained persons, he would go further and say that such trained persons should be under the supervision of a veterinary officer, and he would like to take advantage of the title of that paper to suggest to his colleagues in the counties that meat inspection throughout England was not yet satisfactory in the rural areas; in fact in the county areas it was indeed very unsatisfactory. On a previous occasion he had called attention to that lack, and a remedy had been suggested. As they were aware, the responsibility for meat inspection rested at present with the local sanitary authority, and the duties were carried out very perfunctorily in many cases, and with undue and unnecessary severity in others.

They had now growing up a competent staff who could control all animal carcases killed in that area. A few years ago there had not been such a staff. Now they were growing very rapidly throughout England by the establishment of the County Veterinary Service. He had suggested, and would like to repeat, that they were very rapidly assuming—and in some counties in England they had already assumed—the ability to deal with the inspection of slaughterhouses and with all animals slaughtered therein throughout the counties.

He knew it would be suggested at once that they had no statutory powers in that respect. It would be pointed out immediately that the law at present would not allow such a thing, that the county veterinary officer as such had no standing in the matter, but he would suggest that the principal Statute was very old, being dated 1875. It was high time it was amended, and it would be in the public interest, for not only meat inspection but for many other purposes, if the Public Health Acts were amended; it was for the veterinary profession not to neglect that point, but continually to call upon every Government department concerned for the inspection of slaughtered animals, and to call upon the counties to use their influence to the fullest extent and supervise the inspection of all carcases slaughtered in the county areas.

While they were together on that occasion it occurred to him it was a very good opportunity of reminding his county colleagues that they should bear the point in mind: in veterinary circles he feared that for some time the question of milk supervision and the examination of dairy cows had been so prominent a feature that meat inspection was completely overlooked. They were in danger of being lost sight of, and he would be glad—and he thought it would be of service to the public—if they, veterinary officers, throughout the country, kept that matter to the fore and lost no opportunity of explaining to local government officers and local government representatives the unsatisfactory state of food inspection in county areas, and do their best to mend it. (Applause.)

Mr. J. C. Henderson (Fifeshire County Council), said that it was suggested to him the previous day that he should say something there that day from the layman's point of view; hence his "butting in" to their interesting debate.

Might he say how much he had enjoyed their various discussions throughout the week—but it was a source of surprise to him that up till that day he had only heard two Scottish voices taking part. Unfortunately he lost a good deal from some of the speakers—perhaps they had the best material to give, too—who seemed afraid of using their voices above a certain key.

They were all greatly indebted to Colonel Young for his able paper on the question of the production and inspection of imported meat foods, these being matters very interesting to laymen generally. Many of them had long felt the want of some standardised system of inspection—what he meant was that some inspectors appeared much more rigid than others. They were all at one, of course, that meat of all kinds should be carefully examined, but it might happen that in the smaller places there was a more thorough or acute examination than in other places, where one might have a few thousand carcases to examine. He thought he could speak for the laymen generally when he said that he was of opinion that imported meat did not meet with the same rigid inspection before it left the country of origin, nor could their own inspectors do it the same justice at the port of debarkation—owing to its immensity and having the stockinette coverings—as our own home-produced meat had to undergo. The inspectors standing watching the quarters coming out of the ship, as portrayed by Colonel Young, could not properly say whether the animal had been diseased or not, and he understood it was then sent straight away to consuming centres. But their great objection lay to what was commonly termed "boneless meat." It was imported in bags, and without the bone and other accessory organs, how was it possible in many cases to say what its history had been? He should like that association to give some practical advice to the British Government with regard to this important matter. They would appreciate the point that such meat could not have the stamp of the inspector which Colonel Young very wisely advocated that all meat should bear. If it were impossible to examine every carcase in a consignment of 30,000 carcases of mutton, as he stated, how could inspectors examine the same number of parts of boneless meat? He was glad Colonel Young had pointed out that if centralised slaughtering was adopted they were going to victimise the livestock producers in this country, as butchers, especially in the outlying districts, would purchase what they required in the dead meat market, so as to avoid the trouble and inconvenience to which they would undoubtedly be put. The home producer was promised the first chance of the home market, but this would lead in the opposite direction.

He thanked them all for the kind way they had listened to him and Colonel Young for his most interesting illustrated address.

Mr. W. Tweed (Sheffield), explained that he wanted, if possible, to leave time for a good discussion. As they all knew, he (the speaker) had been an enthusiast for the concentration of slaughter. In 1929 they had 140 private slaughterhouses in Sheffield, and to-day they had only two. He thought they must look at the problem of concentration of slaughter as one which was different in urban and rural areas. In the urban areas he thought there was no question at all but that there should be one abattoir to one urban area. It was quite unsatisfactory to have private slaughterhouses scattered about in thickly populated areas. With regard to rural areas, Colonel Young's point could be met by sending officers round provided with some form of transport and it might be a smaller inconvenience to send them than for the butchers to bring their animals to one centre. He thought as far as urban areas were concerned that concentration of slaughter had been of the greatest value to meat inspection and to public health. He was not too busy with the animals killed in his area to be able to pay attention to meat brought in for sale from rural areas, and it was a curious fact that there was a greater percentage of that meat condemned than of the meat killed in the area. This was very strange, but it was their experience in Sheffield, and, he thought, elsewhere, and that material therefore required careful supervision.

He would support Colonel Young regarding the marking of all carcases. He might say that they had developed this practice by insisting on butchers submitting their meat for inspection at a clearing house. Rather than bring it to a

clearing house, or place of inspection in the city, butchers had approached the local authorities to stamp their meat. The permission of the Ministry of Health to use an official stamp had only been granted to some authorities and they had accepted that meat when it had got an official stamp approved by the Ministry of Health. The stamp on a carcase was preferable to a written certificate, and in connection with the majority of the meat leaving the Sheffield abattoir to go outside the area they were also asked to have the carcases stamped. He thought they as an association should point out forcibly to the Ministry of Health the need for stamping meat in order to obtain inspection.

He would like to ask Colonel Young whether it was permissible to use sacking for covering meat in vans through streets. That had been one problem in which he had never been able to attain the standard that might be attained. He had seen lorries conveying meat elsewhere with waterproof covers. He thought that they as a profession could claim the responsibility for meat inspection. They had only to read the reports of Mr. Gofton in Edinburgh and Mr. DeVine in Birmingham to see the extent to which their departments had control and the way they were carrying out their responsibilities. He thought those two reports were worth referring to, because they stated very concisely how that work was carried out.

There was one other point which seemed to be overlooked in counties, the control of knackers. Two months ago they had a man bringing in meat from a knacker man. They found the meat in his shop, and the butcher was sent three months to gaol to think it over. It should not be possible, however, for a butcher to go to a knacker and buy meat, and he had wondered if the knackers could not be controlled better than they were. Something might be done if the knacker's licence was granted when the Council were satisfied that the meat was disposed of by manufacture or records kept of its disposal.

In conclusion, Mr. Tweed said that he had had pleasure in reading Colonel Young's paper; he looked on Colonel Young as an authority on that subject. (Applause.)

Mr. W. K. Johnstone (Manchester), who followed, said, at the outset, that he would like to thank Colonel Young for his extremely interesting and lucid paper. They had been in Manchester 40 years inspecting meat under a veterinary officer, and the proportion of home-killed to imported was about 50-50. They had had the same trouble as Colonel Dixon with regard to meat sent out: it was extremely difficult to prove without the actual marking that they had seen the meat.

He also agreed with Mr. Tweed. They had had at one time well over 100 slaughterhouses. Now, without having either to close them or to give compensation, they were down to 22.

With regard to the stamping of meat, if stamping were to be done at all he thought that all carcases ought to be stamped and that it should be absolutely universal within the British Isles. He would just like to ask who would bear the cost, the butcher or the local authority.

Mr. Tweed had mentioned that the greater proportion of country-dressed meat had been condemned when compared with city-killed. They also found that. As a matter of fact, he thought he was safe in saying that in Manchester one out of seven carcases was condemned.

With regard to the washing of carcases, he had always been of the opinion that there was far too much water slashed about the carcases. It was doubtful cleansing, and so also was the use of a cloth for that purpose.

The inspections in Manchester were about three-quarters of a million on different carcases, and certainly during the last five and twenty years the complaints with regard to meat going into other districts could be counted easily on one hand. (Applause.)

Mr. T. Parker (Newcastle-on-Tyne) said that he had not intended to speak, but found himself unable to resist the command of the Chairman.

Colonel Dixon and Mr. Tweed had each made reference to a subject of great importance concerning the veterinary profession, namely, the powers of inspection. He thought that Colonel Young had also made some reference to the question of utilising the services of county veterinary officers for the purposes of meat inspection in county areas.

Why he was also referring to that subject was simply because of the fact that most of the issues raised by the previous speakers had been more or less fully dealt with by a departmental committee which sat in London in the year 1921. He happened to be the only veterinarian on that committee. The committee was appointed to consider and report upon the legislative and administrative measures necessary to secure adequate protection for the health of the people in connection with the slaughter of animals and distribution of meat for human consumption in England and Wales. They took evidence and worked at the subject for something like 14 months. As a member of the committee he advocated that the Public Health Act, 1875, should be altered so that the veterinarian as such would have power of inspection and seizure. Although at first he encountered a certain amount of opposition, his suggestions were subsequently brought forward as resolutions and finally embodied in the recommendations of the committee's report. As Colonel Dixon had said, everything possible ought to be done to bring about an amendment of the law for the purpose of giving effect to the recommendations.

Colonel Young made reference to the marking of meat as an indication of inspection. That question was also threshed out by the Departmental Committee; in fact, as a reflection from the committee's recommendations, they would find by turning up Section 15 of the Public Health (Meat) Regulations, 1924, that where a local authority show to the satisfaction of the Minister of Health that they have made suitable arrangements (including the appointment or employment of competent inspectors) for the inspection of animals at the time of slaughter, the Minister may, on application of the authority, authorise them to use for the purpose, a distinctive mark designed and devised so as to indicate the identity of the local authority and of the inspector using the mark. But why had that not been done? Simply because the necessary facilities did not obtain.

Another point that had been raised by a previous speaker was that concerning the protection of carcases against contamination during transport by the use of suitable covering materials. If they referred to the Public Health (Meat) Regulations, 1924, they would find that as a result of the Departmental Committee's recommendations, the regulations contained the necessary power to take proceedings against any-

one carrying meat through the streets without a clean cover, and further, no live animal (dog, etc.) is permitted to be conveyed in the vehicle at the same time as meat.

He had been very much interested in seeing the excellent slides so ably described by Colonel Young, taking them a long journey through the industry of imported meat. It would have been equally interesting if they could have had a similar collection of slides demonstrated, indicating the industry as it obtained in this country in regard to the carcases of animals slaughtered here. However, although Colonel Young had shown them a very fine collection of slides, he was one of those who did not wish them to believe that all the best meat was produced on the other side of the Atlantic. (Hear, hear.) If, for example, as had been demonstrated, it were found necessary in the case of certain carcases of beef or mutton to remove, before cutting into joints, a considerable amount of external fat and therefore waste material, such carcases were not examples of the ideal carcase. About 40 years ago, in our own markets particularly during Christmas time, it was not unusual to find exhibited, carcases of beef with external fat at least three to four inches thick. But such conditions did not obtain to-day. Why? Simply because the producers recognised that there was a time limit beyond which it was not an economical proposition to continue feeding fat stock. In the production of first-class quality beef there must be as little waste as possible and at the same time a proper intermixture between fat and lean. If they compared the carcases produced in this country with those produced abroad—providing on each occasion they were taking the best produced in either country—they would invariably find that there was no better carcase produced in any country than that produced in Great Britain. (Hear, hear.) It mattered not whether one was considering beef, mutton or lamb.

If one took into account the whole of the organisation that had been so beautifully illustrated to them that day, commencing on the ranches, then through the stockyards, the slaughterhouses and finally on the vessels carrying the meat to this country, one would be wondering what it meant from the business standpoint. It meant—as one would conclude by looking at the pictures—that to be successful, the whole of the business must be organised, controlled and worked as a unit with considerable capital behind it.

This reminded him of another subject which had been more or less disturbing the minds of meat traders and agriculturists for some time. Within the past two years a report had been issued by the Economic Advisory Council on the slaughtering of livestock. Anyone who had read it would find that the views expressed therein were apparently based on experience obtained in a country such as South America. And, if it were intended to bring about centralised slaughtering in this country on the lines indicated in the report, then for such a purpose it would be necessary to split the country into about six sections in the centre of each of which slaughtering would be carried out. In each of these centres slaughtering would have to be carried out on much the same lines as described by Colonel Young and illustrated by slides. But in this country carcases were prepared for home consumption and not for export. How could they work such a unit in each of the centres on the lines such as Colonel Young had described and make it pay in this country? To do so, it would be necessary to have control of all livestock from the north of Scotland to the south of England to ensure several thousands passing through each centre daily. If such a system were applied to this country the present methods of buying and selling livestock and the recognised methods of conducting the meat trade and butchering generally would be practically wiped out.

Why he referred to these methods as advocated in the report referred to was because more recently another report, namely, that of the Reorganisation Commission for Fat Stock for England and Wales had been issued by the Ministry of Agriculture and Fisheries. Under the heading of the centralisation of slaughtering, that report stated: " We think that any development of centralised slaughtering will come through the erection of new abattoirs or the enlargement of existing ones by local authorities, and we know that a number of such authorities in various parts of the country are now considering the construction or improvement of a public abattoir."

One other point he might make was this: everything that could be done in this country that was likely to improve the sale of meat from animals produced in this country ought to be done, because the revenue to agriculture depended upon that to a considerable extent. So soon as agriculture showed evidence of going backwards, then the prosperity in the country concerned would move accordingly. Therefore we must do everything we could to maintain our own livestock and meat supplies. (Applause.)

Mr. W. J. Young (Edinburgh), who was the last speaker to take part in the discussion, began his remarks by saying that he had looked with very great interest at the lantern slides that had been produced that morning for their inspection, and he congratulated Colonel Young on having such a fine collection.

Proceeding, Mr. Young said that he had read Colonel Young's paper with very marked interest, and he found himself in agreement with much that he said in his paper. He had been disappointed, however, in finding no reference to chemistry, but he had made up for that defect that morning in mentioning chemistry when he discussed the photograph of the oleo factory. He had given them the composition of the fatty acids.

It seemed to him that chemistry bulked largely in the production of meat. There were many changes going on in muscular tissues during the production of meat. They had the change of glycogen into lactic acid and phosphagen into creatine and phosphoric acid going on all the time in the living animal. Those changes were reversible. When death occurred, the changes took place only in one direction, in order to get lactic acid formed. Lactic acid was a very important substance from the point of view of meat inspection. Without lactic acid they could not get *rigor mortis*.

It seemed to him that their friends across the Atlantic had the advantage of them in this country in being able to spray their cattle before being slaughtered. There was no doubt in his mind that spraying did much to assist the formation of lactic acid. The filth he had seen on the hides of cattle slaughtered in Chicago when he was there last year could not be removed

by the spraying. He was very interested to hear Colonel Young's reference to Messrs. Swift. He had the advantage of visiting Swift's factory in Chicago and he was favourably impressed with some things, and unfavourably impressed with others. He had never seen so much blood in some cases and filth in others. He congratulated Colonel Young on his valuable summary regarding the inspection of such animals.

During the time he had been actively engaged in meat inspection he had to confiscate large quantities of tinned foods. In conversation with meat inspectors he found that very small quantities of tinned foods were confiscated now. There was a reason for that. There had been in recent years a tremendous change going on in the tin plate industry. A few years ago he had recorded in *The Veterinary Record*, (Vol. x, August 23rd, 1930, page 803) something about the tin plate used, and the lacquer of the tin plate. The lacquering seemed to him to be all-important. The lacquers were different. The lacquering for pineapple was different from that used for pears, and there had been much chemical research to find out the lacquers.

Regarding tinned foods, he held strongly that the date should be on the tin, when the food was put in. It seemed to him to be very wrong to eat foods tinned from 15 to 20 years.

He had been a little disappointed that Colonel Young had made no reference to the gas storage of foods. A large amount of research into that subject had been made, and they had been informed that a very large percentage of their food supplies came from remote places, and chemistry had diminished that remoteness. To-day, food which had been slaughtered in Argentina could be brought to this country and consumed in about 33 days. Two years ago food was brought from New Zealand and the Antipodes in gas storage cylinders. The vessels were fitted up, and those containers on the vessels held 20 per cent. carbon dioxide gas. The carbonic acid did not destroy the growth of moulds but only inhibited them.

An interesting matter in connection with gas storage of food supplies came under his observation only recently in connection with kippers. Large quantities of kippers were produced in the outer islands of Scotland, and they came across from those outer islands to a place called Kyle of Lochalsh in Ross and Cromarty. From Kyle of Lochalsh they were taken by rail to London—650 miles—and those kippers were now being conveyed in railway vehicles in which there was 20 per cent. carbon dioxide. Previous to that method of transport the kippers had arrived in London lacking "bloom"—he thought that was a trade expression; they lacked lustre, or bloom—now they were arriving in very good condition.

He found himself in full agreement with the suggestion (made by Major DeVine) that Colonel Young should give them a text-book on meat inspection in this country. They lacked an authoritative book. He thought now that Colonel Young had retired from active service as a very busy official he might find time to give them that book.

He had nothing else to add except that he recommended them all to read the Food Investigation Board's reports carefully. That Food Investigation Board had been set up in 1917 and since then it had published papers and reports of the greatest value to meat inspectors.

The Reply

Lieut.-Colonel T. Dunlop Young (London), who then replied, said that he wanted to thank them first for their patient listening to anything he had said and that he was glad that the slides had been of some value to them. They had taken him a long time to collect, and when the opportunity occurred he had to cast some of them and get the more modern ones. But it was a pleasure at all times to do what one could for one's profession. That was what they were there for. (Applause.)

Coming to the remarks, he might say, to begin with, that he appreciated very much the compliments paid by Major DeVine, because he considered that Major DeVine and his department were a model of what they would like to see in all their cities in England. He had had the pleasure of reviewing his annual report, which they had for one of their journals, and he was struck with the progress made in every direction; he would strongly advise them to read that report, as it was a lesson as to the way they ought to set about their work.

Before going further he would like, in the presence of Captain McLean, to pay a great compliment to the progress made by the veterinary profession in Northern Ireland. (Applause.) Would that they saw something like it in England to-day, but he hoped that from the remarks that had been made and from what they had seen and heard, it would form an object lesson for them in England, and he hoped sincerely that the time would come when they would not only follow but, if possible, get in front.

Major DeVine had referred to his remarks about a non-scientific knowledge with regard to meat inspection. He was sure it was only a little misunderstanding. What he meant was the men who were going round about seeking for a sample and taking it to the public analyst. That did not require a great deal of scientific training. When it came to meat inspection he agreed at once that only scientifically trained men should be entrusted with that work.

Major DeVine had been rather sarcastic about the beautifully clean things that were shown to him, or missed, when he went round. They knew human nature as well as he did and he knew that if his friend, Major DeVine, thought that they were all coming to Birmingham tomorrow he would have it spick and span. Like himself, he was an old soldier, and if they knew the General was coming round they would have a lot of spit and polish on. (Laughter.)

There seemed to be an opinion that only the meat going from one department to another should be marked. Well, everyone was entitled to their opinion; personally, he would like to see all meat marked—there was always the possibility of meat originally intended for local consumption being sent out to another district when not stamped, and trouble might arise.

Someone had raised the question of cost. Mr. Parker referred to the departmental committee and what was recommended in its report. He thought the profession for some time had forgotten how much Mr. Parker did at that time on behalf of the profession, because he did get inserted there that the law should be altered, giving the veterinary officer the same powers as the medical officer and sanitary inspector. It was also included that the butcher should charge 1s. an animal to cover the cost of meat inspection, and that was what was done by the

big frigorificos abroad: the owners paid so much to cover the inspection.

That brought him to the subject referred to as centralised slaughter. He thought there should be centralised slaughter in all cities and urban districts, but they would see by his paper that he referred to the very same thing that Mr. Henderson and other speakers had done, that in the rural districts if a butcher did not want to go to the trouble of going a long distance to the slaughter-house to kill the animals and bring the meat back, it might have a detrimental effect on the consumption of home-killed meat. There was fear at the present time among butchers that a centralised unit would do that, and he believed the butchery trade were up in arms against it. Well, he happened to know that that was not the intention of the committee so far as they knew at the present. Their idea, he thought, was to try probably one area with centralised slaughter and—very wisely—see the effect before they proceeded to adopt it in any other district.

He was very pleased that Mr. Henderson was there that day: he thought they got too few local representatives. He would wish that they could get all of them to come in and know what sort of men the members of the profession were. They had to prove themselves, but if they had tact and did not lack grit they could rest assured that they would get good positions in the field of meat inspection.

Major DeVine had spoken of trichinosis. He was quite right. In the *British Medical Journal* within the last few years several cases had been receiving publication that had come from certain counties uncertificated. That should not be, and he did know that at the present moment the Ministry of Health in England had under consideration a regulation in which it would be found that no offal—no meat produce of any kind—would be allowed from the country unless certified by governmental veterinary inspectors.

Mr. Jackson Young had referred to chemistry omissions from his paper, but he had thought it would be impossible for him to embody chemistry in a short communication such as that.

In regard to the washing of hides, they would not get cracked hides, as they were lying on the grass all the time, with no stones near them. They now got meat from Australia and New Zealand imported under that method, and he could assure them it was at present looked upon as a very great success. The only thing was that it would take a long time before Australia became a great competitor against Argentina, because they had got to improve the accommodation of cattle and feeding and finishing just as they had seen on the slides. They would need to feed the cattle in Queensland. They could not finish them well because in certain seasons they got drought. They would need to feed them there and send them to New South Wales or Victoria, and there finish them off prior to sending them to the meat works, and forwarding the carcases to this country.

Captain Tweed had referred to knackers' meats. He thought that was something of great value. They had had cases in London where knackers had been prosecuted for sending tuberculous cows as human food. If all meat had to be stamped, obviously a cow could not get in without a stamp being placed upon it.

He thought there was very little in the other remarks to which he might take exception; indeed, he felt that the discussion had been more complimentary than otherwise. He could only say that if anything he had said or done that day would be helpful to the profession to which he had the honour to belong, then he was well repaid for what he had done. (Applause.)

Resolution

The Chairman: I have got to put Colonel Young's resolution before the meeting: to the effect that all meat should be inspected and stamped, and that this resolution be forwarded to the Ministries of Health of England, Scotland, and Ireland. I do not know if you would like to add, all meat should be inspected by veterinary inspectors.

Colonel Young: I would add to that, that as far as possible all animals should be examined *ante-mortem* and *post-mortem*.

Mr. J. C. Henderson (Fife): Is that to be from the county of origin?

Colonel Young: From the district of origin.

Mr. T. Parker (Newcastle-on-Tyne): Does that refer to meat sent from one department to another?

Colonel Young: The only difference, I submit, that it would be advisable to make is that, as far as possible, the animals should be submitted to *ante-mortem* and *post-mortem* veterinary examination.

The resolution was seconded by Captain J. Pollard (Halifax).

Mr. Parker said that there was already provision for setting up local marking of meat, and for the control of slaughterhouses. Rural departments possessed the powers that were possessed by all urban authorities throughout the country. He would suggest, seeing that they had all those powers, that it was only necessary for the local authorities themselves to make application if they wanted to do so.

The Chairman said that it was provided for in the Meat Regulations, but it was only optional.

Mr. Parker asked whether they could have an amendment, as it was not applicable to every case.

This was followed by other discussion.

Captain R. Simpson (Carlisle) said that he wondered, regarding the growing services given by County Veterinary Staffs, if it would be proper to suggest that more extended use might be made of those services in connection with getting a better system of meat inspection for rural areas. The staffs were there and could be employed in the useful way suggested by Colonel Dixon. The standard of meat inspection was deplorable; he thought something should be done; and he suggested a resolution to the effect that those services should be utilised.

Colonel Young: I think Captain Simpson means that the recommendation of the English Departmental Committee on Meat Inspection should be adopted; that was, that all county veterinary

inspectors should be employed as experts in the control of meat inspection. Might I suggest that an addition be put to the resolution to the effect that this recommendation be adopted and carried out?

The Chairman: It seems to me that we have got a second resolution here which might be embodied in the first resolution—that is if you pass it—and I would like to suggest that it be added to the other, and the whole thing form one resolution.

The final resolution was in the following terms: "That a resolution that all animals intended for human food be, as far as possible, examined *ante-mortem* and *post-mortem*, and that all meat should be stamped, be sent to the appropriate Government departments of England, Scotland, and Ireland, and that these departments be also urged to make more intensive use of the services of county veterinary staffs in connection with meat inspection in county areas, as recommended by the English Departmental Committee on Meat Inspection."

The resolution was carried unanimously.

Colonel Young said he had pleasure in moving a very hearty vote of thanks to Major DeVine for his conduct in the Chair. This was passed by acclamation, and Major DeVine returned thanks.

NEW POULTRY LEGISLATION

As is pointed out in a recent issue of *The North British Agriculturist*, an important development in the control of poultry diseases is involved in the passing of the Diseases of Animals Act, 1935. For the purposes of the statute domestic fowls, turkeys, geese, ducks, guinea fowls, and pigeons, with certain modifications come within the scope of Part I of the Act which makes provision for the separation of diseased poultry from fowls not so affected, and for the notification of disease in or illness of poultry. Any diseased or suspected poultry or any "contacts" may require to be slaughtered, no compensation being payable in respect of the slaughter of diseased poultry. Under another section of the new Act provision is made for regulating and controlling the import of poultry and eggs. Orders may be made for the purpose of preventing the introduction or spreading of disease and prohibiting the importation of poultry and eggs intended for hatching. There are also provisions for regulating the cleansing and disinfection of receptacles used for the conveyance and exposure for sale of poultry and for the protection of fowls from unnecessary suffering. "Naturally all this means also the granting of power to Government inspectors to examine suspected premises. It should thus be understood that poultry keeping can no longer be regarded as a casual business. Poultry breeders will have to make up their minds to the fact that the utmost care must be exercised in carrying on the industry."

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Sir Sydney Kidman, once the largest cattle owner in Australia and the biggest landowner in the Empire, has died at the age of 78.

Clinical Communications

TREATMENT OF RED-WATER

E. V. KELLY, M.R.C.V.S.
Kells, Co. Meath

In view of Mr. Harvey's paper on the above disease, and the subsequent discussion at the Belfast meeting, the following cases, treated during the past fortnight with Acaprin, may be of interest. Except in one case, cows only were visited, as these animals are generally more severely affected than other cattle.

No. 1.—Heifer on first calf. *August 24th.*—Ten days over time. Treated by owner.

August 25th, 3 *p.m.*—Examined. Temperature 101°. Pulse 145. Muscular tremors. Urine black. Bowels open. Dead calf delivered with difficulty. Acaprin administered. Heifer collapsed and died that evening.

No. 2.—First-calf heifer, eight months pregnant. *August 26th, noon.*—Temperature 103°. Pulse 84. Bowels normal. Urine porter coloured. Acaprin and red-water purgative.

August 27th, 8 *a.m.*—Water clear. Purging freely. No further treatment.

No. 3.—Hereford cow. Calved twins, full time and both alive. *August 28th, noon.*—Water red, but owner thought this was from the calf bed.

August 29th, 3 *p.m.*—Examined. Water black. Temperature 104°. Pulse 78. Straining a good deal and passing small amounts of soft fæces. Acaprin and red-water purgative.

August 30th, 6 *p.m.*—Water almost clear. Bowels acting freely. Feeding well. No further treatment. Owner reported water quite clear the following day.

No. 4.—Jersey cow. *August 29th*, 8 *a.m.*—Owner noticed her dull and milk supply greatly reduced. She was probably then affected.

August 30th, 1 *p.m.*—Owner noticed milk coloured and water black. No fæces for 24 hours. Examined. Temperature 102·5°. Pulse 90. Acaprin and red-water purgative.

August 31st, 8 *p.m.*—Bowels had moved several times but not purged. Feeding well. Water almost clear. Gave 2-lb. treacle. No further treatment.

No. 5.—Shorthorn cow, seven months pregnant. *September 1st*, 6 *p.m.*—Temperature 106°. Pulse 90. Urine porter coloured. Passing small amounts of soft fæces. Acaprin and red-water purgative.

September 2nd, 6 *p.m.*—Purging. Water clear. No further treatment.

No. 6.—Shorthorn cow. Treated by owner with salt, salts and treacle and allowed out in very showery weather. Feeding. (*August 31st.*)

September 1st.—Salt and salts repeated as above by owner. Feeding.

September 2nd.—Large dose of salt, etc., as above and still allowed out. Feeding.

September 3rd, 9 *p.m.*—Examined. Cow had stood the maltreatment well. Pulse 88. Temperature (expected to be about normal) 105°. Bowels acting freely. Water black. Milk coloured. Acaprin. No medicine by mouth. Cow rugged up. Stopped feeding and drinking.

September 4th, 11.30 *a.m.*—Pulse 88. Temperature 99·5°. Water lighter. Bowels acting. No medicine given. Not feeding.

8 *p.m.*—Ditto, but water slightly clearer. Temperature 101°. Pulse 88. Gave half pint whiskey.

September 6th, 11.30 *a.m.*—Cow down and grunting. Water clear. Temperature 99°. Bowels acting. Gave half pint whiskey and four raw eggs in a little water.

8 *p.m.*—Death.

No. 7.—Five-year-old Shorthorn cow. *September 4th.*—In morning, milk reduced. Ditto evening, and dull. Allowed out. Probably affected all day.

September 5th.—Owner diagnosed red-water. Examined at 3 p.m.—Pulse 72. Temperature 102·5°. Water very black. Straining and passing small amounts dry fæces. Acaprin. Saline purgative and treacle, 2-lb.

September 6th, 5 *p.m.*—Water clear. Bowels moving normally but not purged. Feeding. No further treatment.

No. 8.—Two-and-a-half-year-old maiden heifer in fat condition. *September 5th*, 5 *p.m.*—Owner saw water red the previous evening but gave nothing and heifer was left out over night. Called in morning but did not get to see her until 5 p.m. Pulse 72. Temperature 100·5°. Water black. Straining and passing small amounts soft fæces. Acaprin. Saline purgative and treacle.

September 6th, 9 *a.m.*—Purging freely. Water much clearer.

9 *p.m.*—Water clear. No further treatment.

No. 9.—Shorthorn cow. *September 6th*, 2 *p.m.*—Temperature 106°. Pulse 75. Bowels free. Water red but not very dark. Acaprin and saline purgative.

September 7th, 8 *a.m.*—Water clear. Bowels normal but not purged. No further treatment.

Remarks

In the cases recorded above the Acaprin was given intramuscularly (caput muscles). The red-water purgative was magnesium sulphate and potassium antimony tartrate, and the saline purgative in the last three cases was salt and pot. antim. tart. The dose was given with 2-lb. treacle in two gallons warm water by naso-pharyngeal tube.

The result in the first case treated can be ignored, as the animal was probably beyond aid when examined. With the added distress of calving, heart failure was the inevitable result. Case No. 6 was also an unfair one on which to test a treatment. This was a typical case of maltreatment by the owner. The amount of salines given would have turned the tide against most cases: in this case they did not do much harm as the bowels acted freely all the time. Allowing the cow out set matters against her.

It is considered that the results in the other cases were remarkably good, for it is probable that without the Acaprin few of the cases would have cleared so quickly and one or two of them might have been lost. Cases 3, 4, 7 and 8 were undoubtedly affected for 24 hours or more when attended. This may almost always be assumed if the temperature is about normal or there is straining with small amounts of fæces.

The number of cases treated is, of course, much too small to enable one to say if the Acaprin has a specific action, but, taken in conjunction with the results reported by Mr. Harvey and others, it may be possible that, given a reasonable chance, we have at last got a specific against the disease. It is certainly worthy of a further trial.

As this is a clinical record, it is probably somewhat out of place to make any remarks as to treatment in general, but experience of many hundreds of cases treated tempts one to do so. Perhaps it may be permitted to say this much—and it is practically a repetition of what Mr. Harvey advises: All cases visited should be drenched with the tube. This is the ideal method. There is no resistance by the animal except for the second it is entering the nose. Animals are therefore not distressed as they often are by bottling: the less bottling the better—once daily during the course of the disease is enough. Plenty of warm water may be added to the dose and the whole lot given in less time than it takes to give three or four bottles. There is no risk of choking. The so-called "water clearers" and "cures" given by the mouth merit nothing but scorn; many of them affect the case adversely by lessening the appetite, but they often do worse than that. The statement "Every case should be regarded as potentially dangerous until the water clears and the animal is feeding," should be impressed on all stock owners in a red-water district.

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STRANGULATION OF THE BOWEL IN A DOG

H. C. SWANN, M.R.C.V.S.
King's Lynn

Subject.—Eight-year-old, smooth fox-terrier dog.

History.—Four years ago the subject was the

victim of a motor accident, from which it sustained considerable shock and a very badly bruised left thigh. Since then the owner has noticed that for certain periods, varying from two to four days in duration, the dog has been "off colour." The essential symptoms have been anorexia, preference for lying on cold floors, and frequent licking of the left thigh. At no time was there vomition. The owner has found it necessary often to give him liquid paraffin.

A week ago, one of these usual attacks occurred but the above symptoms were more aggravated. After five days, vomition commenced, occurring five to six times a day. The subject became more restless, continually rising and lying down again. Preference for cold floors became more marked. There was complete anorexia and no thirst. The next day the dog was brought to the surgery for examination. The past history was not available at the time of examination. Temperature was 98° and the dog was *in extremis*. A grave prognosis was given and diagnosis withheld.

Treatment.—The dog was given 120 c.c. of glucose-saline subcutaneously. Kaosorb oil (3 iv) with a little brandy was given orally. The patient was then wrapped in blankets and provided with a hot-water bottle. The glucose-saline was repeated four hours later, but death rapidly ensued.

Post-mortem Examination.—This revealed a strangulation of a loop of the small intestine (about twelve inches long) in the abdominal cavity by the left spermatic cord just prior to its descent through the inguinal canal.

The spleen contained three long-standing hæmorrhages and on its capsule there were several milk-spots.

The cause of death was, of course, intestinal strangulation, but it would be interesting to know if the lesions in the spleen were also the result of the accident in question.

[The author desires the name of Mr. J. G. Campbell (Class B), Edinburgh Veterinary College, to be associated with his in the recording of this case.]

CAMBRIDGE MICROTOMES

A recent issue of *Nature* contains the information that this year the Cambridge rocking microtome, one of the most familiar instruments in biological laboratories, attains its jubilee and that the Cambridge Scientific Instrument Co., Ltd., has issued a new folder illustrating this instrument and also a more heavily built and modified form of it for cutting flat sections of larger objects. The folder shows in addition a massively built sliding microtome, the design of which was completely overhauled two years ago, which cuts large sections, 60 mm. by 60 mm., in either paraffin or celloidin, and a freezing microtome of new design. Hints on the care and sharpening of microtome knives are added.

Abstracts

[The Pathology and Therapy of Genital Disease of Cows. Erismann, H. (1934.) *Deuts. tierärztl. Wschr.* **76.** 7. 335-347.]

The examination of a series of cows showing sexual derangement revealed the fact that 287 were suffering from catarrhal metritis. Of these, 60 showed vaginitis, 62 aborted at an early stage of pregnancy, 60 were typical cases of endometritis, whilst 60 had been barren for six to 18 months. The majority of herds under control were free from contagious abortion. Of the 287 cases, 135 showed regular recurrence of œstrum every 19 to 22 days, three showed intervals of less than 19 days, whilst 21 showed intervals of more than 22 days. Twelve showed irregular intervals which were sometimes long and sometimes short, 16 showed no œstral cycle or else nymphomania.

In 14 out of the 287 cases, ovarian cysts were found. Forty-four cases were examined at the time of œstrum, and of these 13 showed retained Graffian follicles and 31 retained Graffian follicles together with persistent corpus luteum. Amongst the whole group, unusually large corpora lutea, present 14 days after the last œstrum, were found in 94 cases.

Methods of treatment included extrusion of persistent corpora lutea, puncture of ovarian cysts, vaginal disinfection and injection of metritis vaccine. Extrusion of the persistent corpus luteum followed by two or three injections of metritis vaccine was followed by conception in 79 per cent. of 131 cases. Vaccine treatment alone, repeated several times, was followed by conception in 69 per cent. of 124 cows. Puncture of ovarian cysts and treatment *per vaginam* was also of value.

E. J. P.

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[Notes on Obstetrics and Cattle Diseases. Goetze, R. (1934.) *Deuts. tierärztl. Wschr.* **42.** 31.]

Contagious Abortion.—Goetze claims that the giving of small repeated doses of colloidal sulphur subcutaneously to pregnant heifers prevents or hinders the course of infection with *Br. abortus*. This chemo-therapeutic prophylactic method, if further tests support it, will offer a very advantageous mode of preventing abortion. [No agent or drug has yet been found which has any beneficial effect on the course of contagious abortion and considerable further controlled work would be required before these claims can be upheld.—*Editor.*]

Impotence in Bulls.—[A reference to the subject matter of another paper abstracted below.]

Obstetrics in Mares.—Chloral hydrate (20-30 grammes in 5-10 per cent. solution intravenously) in combination with epidural anæsthesia (60 c.c. of 1 per cent. Tutocain) has given good results as a preliminary to correcting malpresentations. Goetze prefers the Thygesen and Liess wire saw embryotomes to all others.

Foreign Body Operation.—Experience has proved the value of a technique recently introduced [see *Veterinary Record*, No. 52, Vol. xiv.]

J. E.

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[Impotence in Bulls due to Dysfunction of the Retractor Penis Muscle. Goetze, R. (1934.) *Deuts. tierärztl. Wschr.* **42.** 37.]

Some bulls, while appearing on examination and appearance to be quite normal, are unable to perform copulation owing to retraction of the penis. The author has observed four such cases in which he performed myectomy of the retractor penis muscle at a site a little below the level of the ischium—with successful results. This is a simple operation under epidural anæsthesia. (Four illustrations.)

Other types of impotence are due to adhesion between penis and prepuce or to phimosis caused by the presence of a chronically thickened preputial fold within the preputial orifice. These types have been found to be incurable by surgical means.

J. E.

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[The Treatment of Sterility with Hormones. Koch, W. (1934.) *Deuts. tierärztl. Wschr.* **42.** 28. 433-437.]

Sexual hormones have recently been introduced into veterinary medicine, but before they can be used with any confidence in cases of sterility much experimental work has yet to be done and the cause of the sterility should be viewed from every angle. Successful reproduction depends upon external factors such as feeding, environment, etc., as well as internal factors, and although it is now known that hormones are closely connected with the latter, recent work has shown that there is a connection between the hormonal regulation of reproduction and other functions of the body. Moreover, before a useful therapeutic hormone can be produced for clinical use, its action must be clearly established, it must always be supplied in a similar composition of similar activity and it must be in a form suitable for administration. The only sexual hormones which approach these conditions are prolan and œstrone (œstrin).

Medium doses of prolan stimulate the ovarian epithelium, larger doses cause ripening of the ovum and growth of the follicle and over-doses lead to destruction of the follicle and increased luteinisation. Œstrone acts on the mucous membrane of the genital tract and causes the signs associated with œstrum; over-doses stimulate the pituitary gland which increases the secretion of prolan and thus lead to a harmful action on the ovary. In other words, these hormones stimulate the sexual organs. Their administration, therefore, can only be of value in cases where there is imperfect development of the sexual organs or where it is required to intensify œstrum or stimulate the mucous membrane of the genital tract. It may be mentioned that sterility is sometimes due to faulty nutrition of the embryo through maldevelopment of the uterine mucous membrane due to a lack of œstrone. There is also evidence that œstrone favours embryonal development, especially towards the end of pregnancy. In such cases hormones may be of value, but the real problem of hormonal therapy is to decide which hormonal defect, if any, requires compensation. It is also clear that the risk of overdosage is of greater significance than was at first presumed.

The recognition that urine from pregnant women and animals furnishes a cheap source of hormones has led to great changes in their method of production. It may be that hormones from urine are not identical with those contained in glands and it is doubtful whether prolan obtained from the placenta is identical with that obtained from pituitary glands. Finally, it is undesirable that the maintenance of a breed should depend upon their repeated stimulation with sexual hormones. It has become clear that the capacity for work of the endocrine system varies in individuals and this knowledge should be used to select animals for breeding purposes which possess efficient sexual organs rather than the contrary.

J. A. N.

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[The Value of the Pregnancy Tests in the Case of the Goat. (Trans. title.) Kust and Vogt. (1934.) *Deuts. tierärztl. Runds*, **40.** 34.]

The authors, having previously published work on the detection of pregnancy in the sheep (see abstract, this journal, April 13th, 1935), next turned their attention to this question in the goat, applying a similar technique. They were unable to demonstrate the presence of the ovarian hormone, folliculin, in the urine of goats until pregnancy was advanced at least two-thirds of the total period, when it could, however, be diagnosed clinically without difficulty.

N. S. B.

[The Curative Action of Blood Transfusion in Large-Animal Practice. Kuhn, W. R. (1934.) *Deuts. tierärztl. Wschr.* **42.** 50.]

The author is a pioneer in the employment of blood transfusion in horses and cattle and he here gives a very instructive lecture on the subject.

As in the case of human beings, blood groups exist in animals, but not quite analogously to the former or among themselves.

Kuhn differentiates six separate isolysins in equine blood and states that it is important to determine the groups of the donor and recipient before performing transfusion. This he does by as simple a test as possible—by mixing the r.b.c. of the donor with serum of the recipient: if no hæmolysis occurs the transfusion may proceed without fear of trouble.

Two distinct forms of trouble can follow transfusion—hæmolysis and anaphylaxis; the former may follow each and every transfusion of a given blood whilst the latter is only observed after a repeated transfusion of blood from the same donor. Kuhn has never observed this in work on horses, but has done so in cattle and has seen anaphylactic-like symptoms even after a single transfusion. The intravenous injection of adrenalin quickly stops the anaphylactic syndrome, but has no effect on hæmolysis, which is manifested by general unrest, accelerated respiration, muscular tremors, a rise in temperature and hæmoglobinuria. This can be guarded against by making a trial transfusion of a small amount of blood only—100-200 c.c. If unsuitable, hæmolysis usually makes itself evident after the lapse of a few minutes and recovery follows fairly quickly. If this occurs no more blood from the same donor is to be used. Hæmolysis occasionally does not occur for a matter of days, but such is very rare.

Blood transfusion has been used with success in azoturia in horses, following venesection if it seems desirable, in puerperal hæmoglobinuria in cattle, in strangles, purpura hæmorrhagica, acute infections of new-born animals, and in general or severe local infections or septicæmias of various kinds. An impressive case of recovery from loss of blood from a vaginal injury in a cow at parturition is described.

The author is referring throughout to direct transfusion without citration, but his technique is not given. Citrated blood is, however, very valuable in emergency cases of blood loss and toxæmia.

Professor Neumann-Kleinpaul, in a discussion, referred to the high degree of tolerance for citrate solution possessed by horses. Horses also can usually tolerate large amounts of equine blood transfusions with little risk. The indications for this therapy in equine practice are, however, not yet well known.

[A French practitioner named Brunschwik has recently reported on the use of normal bovine blood in the treatment of hæmoglobinuria in horses. Some cures and some deaths from shock were recorded.]

J. E.

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[What relation exists between Unilateral Blindness or Defective Vision in the Horse, and Capacity for Work? Freudenberg, Dr. (1935.) *Zeitschrift für Veterinärk.* **47.** 2. 33-56. (30 refs.)]

In diseases of the eye not causing blindness, such as conjunctival and lenticular injuries, pigmentation of the lenticular capsule or of the posterior surface of the cornea, exudation into the posterior chamber, hæmorrhages, some defect of vision is always to be suspected.

Diseases causing an abnormal refraction of light are liable to be the cause of shying, particularly if the site of the pathological changes lies in or about the centre of the transparent media of the eye.

Generally speaking, unilateral blindness, partial or complete, is not of greater importance than such conditions as uncertain temper, and poor conformation.

The effect depends largely upon the nature of the defect, and the use to which the horse is put. The greater the need for perfect vision, the more apparent becomes the disability.

In draught and carriage horses, such diseases are of least importance. Hunters learn to jump normally and find themselves in difficulties only when negotiating sharp turns to the defective side, and when traversing very rough country. Racehorses are not affected unless the diseased eye is on the near side (on anti-clockwise tracks).

The various defects of the eye may be classified as follows:—

(1) *Minor Defects.*—Small, sharply-defined opacities of the transparent media and slight, localised diseases of the retina, not in the direct line of vision.

(2) *Medium Defects.*—Large central opacities and extensive disease of the retina.

(3) *Major Defects.*—Gross opacity of the transparent media, changes causing abnormally great refraction, and anomalies of accommodation.

In general, it can be said that unilateral blindness, or the above three classes of defects, do not detract from the usefulness of draught horses, carriage horses and hacks, and that in special circumstances only, blindness and (3) (unilateral) may influence adversely the work of army horses, hunters and racehorses.

The author bases his conclusions upon the records of 32 cases of his own, and upon a survey of the literature on the subject.

E. W. A.

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[The Occurrence of Lead in the Organs and Bones of Domestic Animals. Danckwortt, P. W., and Höll, K. (1934.) *Deuts. tierärztl. Wschr.* **42.** 37. 586-589. 4 tables. (7 refs.)]

Numerous analytical examinations have suggested that the organs of domestic animals may contain traces of lead, and the authors have examined material from normal cattle, pigs and horses. The organs were minced and the organic matter removed by the fuming nitric acid technique; the triple nitrite reaction was used for the identification of lead in the residue and the lead chromate reaction of Schmidt and Weyrauch was used for its quantitative estimation. The average lead content of the liver, kidneys and spleen from a series of cows was found to be 0·051 mg. Pb per 200 g. and the average bone content 0·66 mg. Pb per 200 g. The average lead content of the organs and bones of pigs was found to be considerably higher than that of cows, whereas the few estimations made on material from horses indicated that the lead content is similar to that of cows.

J. A. N.

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[The Toxicity of the Salivary Secretion of Locusts. Curasson, G. (1934.) *Bull. Acad. Vét. France.* **7.** 9. 377-382.]

Deaths have occurred amongst ruminants in Palestine and North Africa on several occasions after the pastures and watering places have been infested with locusts, and the suggestion has been made that the saliva of locusts contains a poisonous substance. It is considered impossible that these cases could have been due to the ingestion of some poisonous plant.

The author has observed that on picking up a locust, it immediately secretes a greeny-brown fluid which consists not only of the secretion of the salivary glands but also of the stomach contents and the secretions of other glands associated with the digestive tract. The subcutaneous injection of ⅛ c.c. of this fluid kills guinea-pigs and rats in a few minutes and 2 to 4 c.c. injected subcutaneously or 4 to 8 c.c. given by the mouth to sheep and goats causes salivation, excitement, muscular spasms, accelerated respiration, vertigo, coma and death. The author has obtained as much as 1/10th of a c.c. from one locust and considers that the fluid is secreted by the insect as a means of defence.

J. A. N.

N.V.M.A. Divisional Report

SOCIETY OF VETERINARY PRACTITIONERS*

MEETING AT TUNBRIDGE WELLS

The above Society held a meeting, conjointly with practitioners from Surrey, Kent and Sussex, on June 28th at the Castle Hotel, Tunbridge Wells. Captain O. V. Gunning (President) occupied the Chair, and the following members and visitors were present: Messrs. L. S. Balls, J. L. Buckingham, H. Scott Dunn, J. B. Dier, R. de Bruyn, E. P. Edwards, F. Marks, W. S. E. Morton, G. S. Peyton, J. W. Pritchard, W. Sewell, C. Roberts, G. M. Vincent and H. W. Steele Bodger (Hon. Secretary).

The circular convening the meeting was read, and the minutes of the previous meeting taken as read and approved.

The following gentlemen were elected as members of the Society: Major T. V. Bagshaw, Lieut.-Colonel J. A. Connell, Mr. J. E. Cartwright, Captain C. J. Peach, Mr. James Robertson, Mr. James Robertson, jun., Messrs. H. Scott Dunn, J. B. Dier, R. de Bruyn, F. Marks, W. S. E. Morton, J. W. Pritchard and C. Roberts.

The President addressed a few words of welcome and appreciation of their presence, to the visitors and members on this the first visit of the Society to the South-Eastern Counties.

The Hon. Secretary intimated apologies for absence from those members unable to attend.

Representation on the Council of the N.V.M.A.—The Hon. Secretary intimated that on its present membership the Society was entitled to send ten members to the Council, and the following were elected to serve for 1935-36: Captain Donald Campbell, Rutherglen; Mr. J. B. Dier, East Grinstead; Captain O. V. Gunning, Tutbury; Mr. J. W. Hall Masheter, Newnham-on-Severn; Mr. P. T. Lindsay, Liverpool; Mr. A. MacKenzie, Market Drayton; Professor William C. Miller, London; Mr. H. L. Roberts, Ipswich; Major R. F. Wall, Boxmoor; Mr. T. Wilson, Nantwich; and Mr. Steele Bodger (Hon. Secretary) Tamworth.

The Work of the Society.—The Hon. Secretary gave a short review of the progress of the Society and its work since its formation in September, 1933, which showed that the Society continues to increase in membership and usefulness, and is now the largest Division of the N.V.M.A.

The necessity of co-ordinating the Divisional representation of general practitioners on the

* Received for publication August 30th, 1935.

"National" Council and its standing committees was pointed out; the Society was doing this, and it was confidently hoped would do so more fully in the future.

As soon as practicable the meetings of the Society would visit all areas in the country, with a view to enabling practitioners to understand its work and objects, and to strengthen its position in some counties and areas where the membership was still small.

So far during 1934-35 meetings have been held at Birmingham, Edinburgh, Derby, Bristol, Newcastle-on-Tyne and London.

Milk (Special Designations) Order, 1935

The following item on the Agenda was then discussed: Draft Milk (Special Designations) Order, 1935 (with the possibility of free Tuberculin Testing).

The Chairman observed that this new order was discussed in London the previous Saturday at a meeting of the Special Committee of the Veterinary Officers and Public Health Committee, N.V.M.A.

The Chairman then read the order in full, this being followed by an analysis of its main provisions and effects by Mr. Steele Bodger, who said he would try to outline the differences between the Milk (Special Designations) Order, 1923, and the New Order.

Mr. Steele Bodger stated that the principal differences were as follows:—

(1) That the Ministry of Health intended to hand the new Order over to the County Councils and County Borough Councils to be run as they thought fit. Instructions as to how it should be run were apparently to be left very vague, and he thought that there would be even more difference of opinion between the County Councils as to how the Ministry's instructions were to be interpreted and the Order worked, than there was at present over the administration of the Accredited Herds Scheme.

In his opinion the decision of the Ministry to hand the Order over to the County Councils —though inevitable—was a retrograde step and not in the best interests of either milk producers or the consuming public.

(2) That there was in future to be only one grade of tuberculin tested milk—certified milk—and that the permissible bacterial count would be 200,000. This, the Hon. Secretary was certain would cause dissatisfaction amongst the present producers of certified milk, and in his opinion the permissible count was far too high —another retrograde step.

The test for coliform organisms was to be abolished altogether.

(3) Cattle entering a certified herd must be retested after two months unless they came from a certified or an attested herd, but in his opinion, even those animals which came from certified herds should be isolated until they had been retested—failure to adopt this precaution had been the ruin of many hopes.

(4) There was to be permissive pasteurisation of certified milk. Whilst not agreeing that this was necessary, the Hon. Secretary thought that if it would increase the confidence of the medical profession—a very large majority of whom knew nothing about the present-day conditions of production of *clean* milk—and increase the consumption of tubercle-free milk, and so increase the production of this milk, then it would be worth while.

(5) No animal in a certified herd must be "vaccinated." As the Order stood, this applied to both live and dead vaccines, and for any purpose whatsoever.

(6) Grade "A" milk was to be abolished, and the term "Standard" milk was to take its place; this was to be substantially the same as the present "Accredited Milk," but distributors were not allowed to use the term in selling milk.

A special chemical test was to be used for "Standard" milk, instead of a bacterial count.

The risk to practitioners, proceeded the Hon. Secretary, was that where the powers of administration were vested in the local authorities they—the local authorities—would follow the example of several Scottish counties and refuse to recognise the certificates, either for tuberculin testing or clinical examinations, of private practitioners.

Further, local authorities might conceive it to be their duty to institute free or semi-free tuberculin testing, and so compete unfairly with practitioners, many of whom had given many years of service and special thought to this subject.

The Hon. Secretary urged all those present to be wary and to report to him at once any unfairness or irregularity which came to their notice, so that he could take the matter up in the proper quarter.

By co-operation and united efforts the Society of Veterinary Practitioners had been able to combat unfair competition successfully and to obtain redress in a number of instances, but it was essential that they should be able to link up counties and get more and more members if they were to be of real service to practitioners.

Mr. E. P. Edwards (Mold) said that he understood that under this new order there was a distinct possibility of free tuberculin testing being advocated in counties and boroughs, and that possibility should be seriously and resolutely considered.

The practice of free or semi-free testing of herds appeared to have started in Scotland some six years ago, and in the counties of Lanark, Stirling, Dumbarton, Ayr and Dumfries, continued to be done by the whole-time staffs

exclusively, and at purely nominal fees. Moreover, in those areas the ordinary practitioner was not permitted to do the testing of licensed herds, and his certificate was not accepted by the authorities. Vigorous protests by the practitioners against the procedure had been of no avail, and although attempts had been made to induce the authorities to implement their power to nominate practitioners to do this work within their own practices, this power had never been exercised, and recently had been expressly refused.

The whole subject was first brought prominently before the notice of the profession generally, through letters sent to the Society of Veterinary Practitioners within a few days of its formation in September, 1933. One came from Mr. A. J. Kennedy, B.SC., M.R.C.V.S., Thornhill, Dumfries, which showed that for several years he had been *prohibited* from doing the testing, and his certificates *refused* for grading purposes. Another came from Mr. Paul Crosfield, M.A., M.R.C.V.S., of Chipping Norton, Oxon., who revealed that free testing of all herds supplying milk to the city of Birmingham was carried out by the veterinary officers of that city. The Corporation, moreover, made this free service widely known by a circular letter sent to all farmers sending milk to the city, and Mr. Paul Crosfield complained that although Chipping Norton is 45 miles from Birmingham, he had during the previous three years lost the work of testing numerous herds in consequence.

These letters, continued Mr. Edwards, together with details of the nominal testing fees charged in the already named Scottish counties, were published in a letter by him which appeared in *The Veterinary Record* of April 7th, 1934. Other correspondence followed in several succeeding issues of the paper, and an appeal was made to the members of the S.V.P. with a view to discovering if the procedure existed elsewhere.

Following upon this, a complaint was sent to the "National" that free testing was being done under the Borough Council of Bolton. The matter was investigated by the Public Health Committee of the "National" and Mr. John Holroyd was asked to go as a delegate to state the views of the Council to the Bolton Council. Mr. Holroyd's mission was entirely successful; the Bolton Council realised the general injustice of the procedure, and to their own ratepayers in particular; free testing was abolished, and the work returned to the practitioners concerned.

Whatever historically might have been the justification, if any there was, for the origin of this practice in Scotland or elsewhere, until and unless there was established a general State Veterinary Service, financed by the Imperial Exchequer in the interests of Public Health, it would seem impossible to justify this procedure, but rather to deprecate it strongly. Again, viewed from the standpoint of the organisation of the veterinary services of the country, it would appear to be not only unfair to the main body of the profession, but also a lamentable waste of its scientific, physical and economic resources. Could it be true national economy in money, time, scientific personnel and physical resources, to send men scouring the country to do a job which could be as efficiently done by those who were on the spot?

There was also an ethical aspect of the matter, emphasised in its most undignified form by the advertising tactics of the city of Birmingham.

It was being rightly asked whether the practitioner who had entered the profession relying upon his college and its charter to protect his competitive right to earn his livelihood, was not entitled to ask the Council of the R.C.V.S. seriously to consider this aspect.

"I am convinced," said the speaker, "that the great majority of the Council of the N.V.M.A., and men of all shades of opinion within and without it, are opposed to this procedure, and would suggest the two following resolutions to go from this meeting:—

"*Resolution I.*—'That this meeting of the Society of Veterinary Practitioners, held conjointly with practitioners of Surrey, Sussex and Kent at Tunbridge Wells on June 28th, 1935, is of opinion that the free tuberculin testing of herds by the whole-time veterinary officers of county and municipal authorities is wrong in principle; that it constitutes a serious economic injustice and loss to practitioners; that is an unfair competition by sheltered staffs which is unnecessary in the public interest, and, when accompanied by refusal to give official acceptance to the certificates of private practitioners, is calculated to undermine their prestige, and to destroy the confidence of their clients in their professional ability and standing.'

"*Resolution II.*—'That this meeting of the Society of Veterinary Practitioners respectfully requests the Council of the N.V.M.A. to appoint a Special Committee to investigate the subject of free tuberculin testing, especially in its economic and ethical bearings, and its consequences within the profession and to agriculture.'"

Mr. Dier gave evidence of an instance where the herd of a client of his had been tested free by a whole-time veterinary officer in connection with the Attested Herds Scheme, even though that herd had been found to contain reactors when last tested by himself.

The Hon. Secretary promised to forward this

complaint to the proper quarter if Mr. Dier would supply him with chapter and verse.

A very useful general discussion followed, and the President suggested that the resolutions might best be moved by practitioners in the district, and also pointed out that members might do a great deal to place the practitioners' case against free testing clearly before local authorities, the farmers and the local farmers' unions, as opportunity arose.

The first resolution was then proposed by Mr. Morton, seconded by Mr. Dier and carried.

Mr. Scott Dunn proposed and Mr. Buckingham seconded the second resolution, which was also passed, and it was resolved that both be sent to the Council of the N.V.M.A.

The Cattle Diseases Report

The meeting next considered the Report of the Special Committee appointed by the Council of the N.V.M.A. to consider the Report of the Cattle Diseases Committee of the Economic Advisory Council (*vide The Veterinary Record*, February 2nd, 1935, page 137 *et seq.*).

The President called upon Mr. E. P. Edwards to open the discussion.

Mr. Edwards said: "I hope the meeting will not be tired of hearing my voice, but I must obey the President. You will, I trust, all have studied both reports to which the Agenda refers. The Gowland Hopkins report foreshadows very great and necessary changes in the front which the nation is to make towards the eradication and control of animal diseases, and first of all towards tuberculosis and milk infected with it.

"This report opens out a vista of the first importance to the veterinary profession, and we see the opportunity of a vast extended field of public service.

"It is tuberculosis and a pure milk supply which occupy the foreground, but the further view brings contagious abortion, mastitis and Johne's disease clearly in sight, whilst on the horizon we find 'Any functions that may be imposed upon them in connection with other diseases of livestock and poultry'—a truly stupendous programme for local authorities and this profession to tackle.

"I do not intend to say anything about the technical side of the scheme; that has been so often and so ably done, and published.

"We are a meeting of general practitioners and realise the opportunities, responsibilities, and great consequences to agriculture, the public, and our profession which are involved. The programme is so vast and wide that one would have thought the whole resources of the profession would have been mobilised and might even then prove none too great to meet it. But disillusion awaits us, for the Hopkins Committee have thought otherwise, and propose to confine this task and responsibility to a special and to-be-created section of the profession, excluding general practitioners entirely, after a period during which they are to be allowed to serve as a stop-gap.

"The other report on the agenda, that of the N.V.M.A. scheme, proposes by contrast to utilise the services of the profession as an entity, a whole-time staff of area, county, and municipal officers to co-ordinate and direct general practitioners as field officers and clinicians, with laboratory officers to serve both, and all under a supreme head, responsible to a Ministry. This is the outline of the plan which the N.V.M.A. stands by, and which I take it all of us here stand by.

"But it is little good advocating or standing by this scheme if we are merely doing so because it affects our daily bread—the public interest and the best service to agriculture must be the first standard by which to judge any scheme. And it is from these standpoints that I want to ask myself and to ask you whether, eliminating as far as humanly possible the personal factor, we can give sound reasons why it will be to the good of the public, of agriculture and of the profession that practitioners are retained in any service designed to combat and control animal disease and, on the other hand, equally sound reasons why it will be bad for those same interests to leave them out.

"One ruling consideration is here essential; our views must be long views, based not only upon the here and now, but upon what may be the ultimate results of these interests. I think there are many such reasons which can be urged, and which we would all do well to have clearly in our minds and be prepared to state intelligently to farmers, local authorities, and organised agricultural bodies.

"May I say as my first 'article of faith' that I believe that the practitioners of the country are just as capable professionally of doing the work required as any other of its members. We want to be moderate and modest, so I will leave it at just that, although possibly many of us might think that years of clinical experience and knowledge of animals in health and disease are an added equipment befitting us to function even more efficiently than young graduates with little or no such experience. The past record of the practitioner in this and similar public work is a good record, as the history of the control and elimination of contagious disease and many scourges in the past amply proves. Many of the shortcomings which have been rashly laid upon the shoulders of the practitioner rightly belong to the shoulders of those local authorities who by the laxity or

total neglect of the administration of the functions assigned them, crippled the practitioners' work and, given a national standard of such administration, the future record of the profession would, in my view, be a still more creditable one.

"We are told that practitioners differ enormously in their capabilities. Of course they do; so they do in every other profession, and is there any reason to suppose that the same will not apply to whole-time officers? In any case, is there any justification for formulating a scheme on the assumption that the *mass* of the personnel of a profession consists of the unfit, instead of forming the *exception*. Could the veterinary profession exist at all if that were true? And yet it is upon some such assumption that the Hopkins Committee appears to have framed its scheme.

"A second article of my faith is that the combination of officers contained in the 'National' scheme would cost no more, and probably considerably less, than the specialised one. It is the considered opinion of the 'National' Committee which prepared the report 'that the scheme would be more economical than the Hopkins scheme, as it would allow more veterinary surgeons to be employed at the same cost.'

"There are many possible pitfalls in the finance of all schemes, but I am convinced that the practitioners of the country would not let any national scheme fail on that score, but would loyally fall in with any reasonable scale of remuneration found necessary to ensure its success. Moreover, I believe that, pound for pound of cost, such a combination would give better value for money by reason of the more intimate service the practitioner could render owing to his local knowledge of the farms and farmers, and from the confidence the latter place in him as their ordinary veterinary attendant.

"Thirdly, whereas it is admitted by the Hopkins Committee that a specialised service of 300 or more officers will take a considerable time to materialise, and will largely consist of young graduates with little experience, on the other hand there are ready and distributed where needed a sufficient number of experienced men at once available for the work and willing to be co-ordinated and directed by the whole-time officers which the scheme embodies.

"Again, I believe that the practitioners of this country as a body have as high a standard of professional integrity as any other section of it, or as is found in any other profession. There are black sheep in every flock, but no shepherd, unless he is colour-blind, sees all the fold black because of them.

"After our first flush of indignation we can afford to ignore, if not forget, that ill-conceived and sweeping reflection in the report upon a body of professional men. It is now, I trust, discredited.

"More important even than these reasons for retaining the practitioner are those which go to show how damaging it would be to agriculture, the profession, and the community to leave him out. The first of these is that to do so will be to destroy him economically, to drive him out of practice, and so denude the countryside of the general veterinary service essential to agriculturists. The reality of this menace has long and frequently been voiced by many of the most eminent, impartial and most detached members of the profession. It is no longer a menace only, but a reality, and, often as it has been voiced, it cannot be too often or too forcefully repeated, for it is literally true already. No one can tell those of you who may have been displaced by a whole-time service what you have lost, or what others of you will lose if your turn comes to be displaced—you know. These losses range, within my knowledge of cases, between £100 and £400 a year, and in these days of depressed agriculture and many bad debts, part-time inspectorships form the chief source of income which could be relied upon to come in regularly, and yet the Hopkins Committee told you solemnly, if naïvely, that far from damaging your practice, their scheme would increase it.

"It may well be asked what number and what quality of men will enter general practice in the future, to face for a pittance the daily round of hazardous and laborious drudgery which will be the only field left to them. The answer is obvious—the consequences to agriculturists equally so, and farmers are quick to realise when it is put clearly to them, that whatever they might imagine they stand to gain on the official 'swings,' they would lose with compound interest on the every-day 'roundabouts.'

"The final consideration I will mention is perhaps the most serious of all to our profession, and as yet possibly the least appreciated, because it is more subtle and further removed from us in point of time. The exclusive whole-time system implies, does it not, a certain specialism, and if we visualise the profession after, say, ten years of its extension, we should find on the one hand an accentuated specialism, and on the other an emasculated general practice. The whole-time men would become experts on certain subjects and in a certain technique and would run on those narrow lines to the exclusion of the rest of the field of veterinary activity and experience.

"On the other hand, the great body of the clinicians of the future would be deprived of the exercise of their art in the very important and ever-widening field covered by the whole-

time men, with the result that they could only become men of greatly limited knowledge and experience. Both men would be what may be termed 'half-men,' neither of them fitted singly to deal with the daily needs of agriculturists, and we may well ask whether the latter will ever desire or be able to afford to employ both.

"To my mind all concerned may well pause and ponder before hailing a wide whole-time service as an unmixed blessing. Would not it be better rather to aim at a first-class, all-round man as best fitted to serve the agriculturists of to-day and of the future? Our problems are grave and great and must be faced with courage, goodwill, the spirit of compromise and the determination to give of our best towards their solution both in our daily work and in our councils.

"In this connection I would like to commend to all practitioners the work which this Society has already done, and will continue to do with your support, to amalgamate and co-ordinate the practitioner elements of all the Divisions within the N.V.M.A. And this not in any antagonistic, narrow, class spirit, but nevertheless determined to voice the just claims of their body to take its fair and rightful place in the profession and its public work. We do not want to hurt anybody else, but also we do not want anybody unjustly to hurt us, and, above all, we want to maintain the integrity and prestige of the profession as a whole." (Loud applause.)

Mr. J. L. Buckingham (Harleston) instanced cases of hardship in the appointments of practitioners under the Accredited Herds Scheme and expressed the opinion that all suitable men engaged in and experienced in cattle practice, whether they had previously held part-time appointments or not, should have an equal chance of doing this work within the areas of their practice, and under whole-time supervision. This would be equitable, and inefficient or unsuitable men would soon be weeded out.

Mr. Dier thought panels of practitioners the fairest and best basis of appointment, and it was pointed out that in the N.V.M.A. scheme such panels were suggested for every county.

A general discussion followed, and Mr. Edwards was cordially thanked for his valuable observations.

The Chairman and Hon. Secretary were also thanked for their efforts on behalf of the Society.

At the conclusion of the meeting the members took tea at the invitation of Captain Gunning.

H. W. Steele Bodger, *Hon. Secretary.*

Messrs. J. W. Whitehurst and Son, Stanton-under-Bardon, Leicestershire, have lost their Shire stallion, Gold Standard, through the bite of an adder. The horse had been hired to Wimborne and Verwood Shire Horse Society.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Sept. 23rd.—**Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4 p.m.**

Sept. 24th to 25th.—Jubilee Memorial Prize Examination.

Sept. 25th.—Annual General Meeting of the Society of Veterinary Practitioners, Grand Hotel, Birmingham, 2 p.m.

Sept. 27th.—Meeting of the Southern Counties Division, N.V.M.A., at Southampton, 2.30 p.m.

Sept. 27th.—Meeting of the Midland Counties' Division, N.V.M.A., at Birmingham, 2 p.m.

Sept. 28th.—Meeting of the North of England Division, N.V.M.A., at Newcastle-on-Tyne, 3 p.m.

Sept. 30th.—N.V.M.A. Committee Meetings, 2, Verulam Buildings, W.C.1.

Oct. 1st.—N.V.M.A. Committee Meetings, 2, Verulam Buildings, W.C.1, and Council Meeting, Connaught Rooms, Great Queen Street, W.C.2.

Oct. 3rd.—Annual General Meeting of the Central Division, N.V.M.A., Conway Hall, W.C.1, at 6.30 p.m.

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PERSONAL

Appointment.—Mr. A. J. Adams, B.Sc., M.R.C.V.S., has been appointed assistant veterinary officer to the County Council of the West Riding of Yorkshire, in place of Mr. H. M. Salusbury, M.R.C.V.S., D.V.H., who, as already has been announced in our columns, has been appointed as chief veterinary officer to the City of Sheffield.

Birth.—Scott: At Ramsay Lodge Nursing Home, Edinburgh, on September 16th, 1935, to Joan, wife of Walter Scott, F.R.C.V.S., D.V.S.M., Edinburgh, a son.

Will.—Mr. Mark Tailby, of Edgbaston, retired veterinary surgeon, who died on April 14th, aged 95, left £26,140 gross, with net personalty £13,576. He left £100 to the Victoria Veterinary Benevolent Fund.

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R.C.V.S. OBITUARY

Cawthorn, William, Captain R.A.V.C. (T.F.) (retd.), 53, Craven Park Road, Harlesden, N.W.10. Graduated London, July 14th, 1903. Died August 29th, 1935; aged 54 years.

The late Captain Cawthorn, who had practised in north-west London for many years, was well known in Masonic circles. One of the founders of St. John's Lodge, he became Worshipful Master in 1919, and was P.Z. of St. John's Chapter, and the Harlesden Chapter, obtaining London Rank and London Chapter Rank.

THE LATE MAJOR R. F. STIRLING

Since the publication in our last issue of our notice of the life and work of the late Major Stirling, Director of Veterinary Services, Central Provinces, India, a tribute to Major Stirling's meritorious record has been received from Mr. G. Shanker, the Deputy Director. In this communication particular emphasis is laid on Major Stirling's achievements in completing the task initiated by his predecessor, Mr. C. W. Wilson, of "steering the department clear of all impediments and making it as useful to the public as was practicable," in the introduction of goat virus vaccination to protect cattle against rinderpest and in making great progress towards the eradication of piroplasmosis from Central Provinces and Berar through his practical advocacy of the use of trypan blue. It is pointed out, in this connection, that during the period that Major Stirling was in charge of the department, activities in disease control were doubled and did much to check the prevalence of those cattle diseases which have been for centuries a source of grave economic loss to the impecunious peasantry of the area.

"Major Stirling had endeared himself to everyone in the Department," adds our correspondent, "and to the public his loss is also irreparable, mainly because their interests, both economic and social, were safe in his hands. The local self-government departments, whenever they showed lack of enthusiasm, were stimulated with a tact which does much to explain the smooth and successful working of the Department throughout the seven years of Major Stirling's directorship."

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BUTCHERS AND THE THREATENED HORSE BAN

"Only a week or two ago I mentioned here that a number of butchers who gave up horses in favour of motor power both for haulage on the roads and on the land, had returned to the horse," writes "Hambletonian" in *The Meat Trades Journal*. "They have found the old methods more economical. Last week I recorded still further evidence of revolution when I regretted the import of large consignments of Belgian horses into this country. Now we hear of a renewed appeal for horse-drawn traffic to be banned from the streets. The only excuse for this seems to be that horses are a nuisance to those to whom speed is the one essential in life. The Minister of Transport seems to be in sympathy with the demand that, in London at any rate, horses should be expelled from the streets, and that all those concerned with haulage should, no matter how unsuitable to their business, be compelled to adopt motor-vans. If such regulations were applied to London it would follow as a natural, logical conclusion, that they would follow at Leeds, Liverpool, Manchester, Newcastle, and elsewhere. Such a change would not be effected without an outcry, for it must be remembered that a considerable number of those who changed from horses to motor-vans and motor lorries, only did so because the roads were made so unsafe for horses. They have always regretted the course they took. This further playing into the hands of motorists at the expense of horses will arouse very considerable indignation unless Mr. Hore-Belisha is made to understand that the horse is by no means a back number, as some are inclined to imagine."

BRITISH ASSOCIATION MEETING AT NORWICH

(*Continued from page* 1138.)

Animal Migration

In opening discussion of this subject by the Zoology Section, Professor J. Ritchie, of Aberdeen, distinguished between true migration, as of birds, and more limited and sporadic wanderings. Even bats only showed the latter. Eruptions like those of lemmings were one-way movements, due to abnormal population pressure, and should be placed in a different category.

Dr. N. A. Mackintosh gave an account of the migrations of whales as determined by the Discovery expeditions. Whales showed a true seasonal migration, as birds did, feeding mainly in high southern latitudes and breeding off the west coast of Africa.

Dr. A. Landsborough Thomson gave a general account of bird migration. Three separate problems must be distinguished — namely, the releasing stimulus to migration, the method by which migrating birds found their way, and the evolutionary origin of migration. Much progress had been made recently with the first, but the second remained mysterious, and the third was still a matter of speculation.

Dr. E. S. Russell, of the Ministry of Agriculture and Fisheries, gave interesting examples of fish migration. Many fish migrations, he said, were true migrations, like those of birds, although the return of the young from the breeding places was partly passive in currents or down-stream. Recent work on salmon showed that salmon returned to where they were hatched, not to where their ancestors had been accustomed to spawn.

Dr. C. B. Williams summarised progress in the field of insect migration, about which little was known until recently. He said that in some cases true migration occurred. The Monarch butterfly of North America returned to the same localities year after year for the winter state of semi-hibernation. Here the return to higher latitudes took several years, and was more in the nature of slow spread than directed migration. Other cases, such as those of the Painted Lady butterfly and the locust, were of somewhat different nature and recalled the one-way pressure movements of lemmings.

Dr. Fraenkel stated that insect migrations were always executed *en masse*, never by solitary specimens, and he conjectured that massing induced a psychological change conducive to migration.

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Colour Inheritance in Budgerigars

Professor Crew, of Edinburgh, reported to the same Section on colour inheritance in budgerigars. The budgerigar is of considerable theoretical interest to the student of evolution as showing that numerous forms may arise in a species, as a result solely of mutation (over half-a-dozen are known), without crossing with any other species. All the existing colour varieties have arisen during domestication within the space of less than a century, and it is certain that the wild type is a pure species. Of no other domesticated animal can it be said with absolute certainty that species-crossing has not entered into its history. Budgerigars are also interesting on account of the relatively frequent occurrence of "half-siders," in which one lateral half of the bird is of one colour, the other of another. It appears

fairly certain that these are due to the elimination of one chromosome in one half of the early embryo.

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Early Man

Sir Arthur Smith Woodward, addressing the Section of Anthropology from the standpoint of a paleontologist, dealt with recent progress in the study of early man. He concluded that the four main finds of really early man, Piltdown, Pekin, and Heidelberg man, and Pithecanthropus, were roughly contemporary, dating from the early Pleistocene, and indicated a considerable variability and plasticity in the early stages of human evolution. On the principle first enunciated by Matthew that when evolution is proceeding in a certain area waves of radiation would bring the earliest evolved types to the periphery, leaving the latest types near the centre, we should conclude that Central Asia was the scene of man's early evolution. This conclusion was borne out by evidence.

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HOMAGE TO BARLOW

Under the above heading *The British Medical Journal* pays tribute to the great pioneer work in the investigation of infantile scurvy carried out by Sir Thomas Barlow, who celebrated his 90th birthday on September 4th. The symposium on this disorder which is constituted by the August issue of the *Archives of Diseases in Childhood,* published as a Birthday Number, illustrates the enormous field laid open by the discovery of Barlow's disease and the extent of the penetration into it achieved by his pupils and followers. It was in 1883 that Barlow showed clearly, with a wealth of clinical and pathological detail, that scurvy and rickets were widely different maladies, and his original paper, reproduced in the present symposium, easily holds its own with the more modern contributions. Chemical studies of the vitamins contained in food substances, of the body's metabolism of vitamin C, and of its powers of synthesis and storage are proceeding at many centres and will gradually illustrate many points not yet altogether clear. "The chemists and the clinicians have much work yet to do, and almost every contributor to the symposium writes of the future with enthusiasm. There could be no better form of homage."

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STUDENTS' NUMBERS OF THE MEDICAL JOURNALS

In our own comparatively small profession, with its limited number of training colleges and courses qualifying for private practice or entry to the various types of services, no difficulty confronts the parent or would-be student in securing all the information available relative to veterinary surgery as a career. With the sister profession of medicine, however, matters are far otherwise — the multiplicity of licensing bodies being largely responsible—and in publishing each year a conspectus of courses in medical education *The British Medical Journal* and *The Lancet* render an indispensable service. This year, both periodicals devoted their issue of August 31st to this Students' Number and both issues reflect the progressive nature of the educational medical curriculum. The *Journal* has some out-spoken comments on medical training and practice and their regulation by the former Dean of the Faculty of Medicine of the University of Liverpool, together with an informative editorial review of the present position of the profession of medicine, in which occurs the much-quoted observation "Some think that saturation point has been reached," while *The Lancet* deals editorially with the reform of the curriculum and, in a special article, with the present-day openings of medical practice. Both journals give full information concerning the Medical Examining Bodies and Schools in England, Scotland and Ireland, Post-Graduate Study, Tropical Medicine, the Public Health Medical Services, and Dental Surgery.

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ARMY VETERINARY SERVICE

London Gazette—War Office—Regular Army Reserve of Officers

Sept. 13th.—Lt.-Col. J. R. Hodgkins, D.S.O., F.R.C.V.S. (ret. pay), to be Lt.-Col. (Sept. 1st), with seny. Nov. 25th, 1931.

Regular Army

Sept. 17th.—Lt.-Col. R. W. Mellard, D.S.O., retires on ret. pay (Sept. 17th); Maj. and Bt. Lt.-Col. E. G. Turner, D.S.O., to be Lt.-Col. (Sept. 17th); Capt. A. G. Heveningham is secd. for serv. under the Colonial Office (June 30th).

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THE OSTEOPATHS BILL

The report of the Select Committee of the House of Lords on the Registration and Regulation of Osteopaths Bill, together with the proceedings of the Committee and the minutes of evidence, has been published by the Stationery Office. The price is 15s. net.

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GLASGOW PASTEURISATION SCHEME

The Health Special Services Committee of Glasgow Corporation has decided to ask the Parliamentary Bills Committee to include in the next Provisional Order promoted by the Corporation clauses to regularise the pasteurisation of all milk coming into the city, and also to set up a standard of purity for milk.

It was explained by Councillor Stewart Reid, convener of the committee, that a report was received some time ago to the effect that a fairly large quantity of milk came into the city in a raw state, and also that a large percentage of it passed through pasteurisation plants of a type not approved by the Department of Health. About 33 per cent. of the milk was pasteurised in approved plants.

The aim of the committee was to control every gallon of milk that came into the city for human consumption. The committee also proposed to ask for power to build a municipal pasteurisation plant if necessary.

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POULTRY DISEASES COMMITTEE

The Minister of Agriculture has appointed a Special Committee to investigate problems of breeding, production, distribution of stock, disease and mortality of poultry. The Committee includes persons with technical qualifications, but the personnel has not yet been announced. Representation on this Committee has been sought by the N.V.M.A. on behalf of the veterinary profession.

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A FORTHCOMING POULTRY CONFERENCE

The Twelfth Annual Poultry Conference at the Midland Agricultural College, Sutton Bonington,

Leicestershire, will be held on Tuesday, September 24th.

At an afternoon session, Mr. N. Dobson, of the Ministry's Veterinary Laboratory, will speak on "Poultry Diseases," and Mr. W. M. Golden will open the discussion.

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BOTULISM

"After an interval of almost exactly 13 years the public have been startled by the occurrence of another group of deaths due to botulism," says *The Lancet*, in reference to the recent deaths in St. Pancras of three women as the result of eating nut meat brawn. Neither in this nor in the earlier (Loch Maree) outbreak was there any indication that the food concerned was abnormal or unfit for consumption, and in closing the inquest on August 23rd the coroner said there was no indication that food in bottles was any more dangerous than food in tins.

The mere consumption of *B. botulinus*, which is very widely distributed in the soil, is not sufficient to cause botulism; the ordinary conditions of the alimentary tract are not those in which it flourishes. The clinical picture of an acute case of botulism in man "is characteristic and very terrible"—a syndrome of paralytic symptoms steadily increasing in intensity and finally productive of air-hunger through weakening of the action of the respiratory muscles, with cardiac paralysis. Death occurs from 36 to 72 hours of onset, and the mortality may be 100 per cent. in some outbreaks.

Fortunately, then, botulism remains one of the rarest of diseases in human beings, despite the almost universal distribution of the organism throughout the soils and pastures of the world. It is relatively more common in parts of the continent and in America than in this country "for reasons well understood and connected with the national food habits of the people." For, although the spores of the bacillus are highly resistant to heat, the deadly toxin is readily destroyed by temperatures commonly used in preparing foods. However, the world over, the temperatures used by manufacturers of tinned foods are well above those necessary to destroy the toxin and designed to kill the spores as well. The result is that botulism remains a rare condition—so rare, that an outbreak, lamentable as it is, "causes concern and alarm out of all proportion to its prevalence."

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Professor Wright, of the Royal Veterinary College, speaking at the New Health Summer School at Margate recently, said that organisms which caused food-poisoning did not make the food look or smell bad. On the other hand putrefactive organisms, which did make food look and smell bad, were generally not toxic. If they were toxic there would be hardly a dog alive to-day.

In man, botulism (food poisoning) was a toxæmia, and the organisms only multiplied when there was no oxygen present. If food became contaminated, and if the process of manufacture had been insufficient to destroy the organisms, and if there was any oxygen present, as was the case with most glass bottles, the organisms multiplied, and anyone eating the substance would suffer from a disease of the nervous system. Although it had been brought before the public in the last few weeks, it was extremely rare.

THE PRESENT-DAY SCIENTIFIC INTEREST IN PASTURE RESEARCH

There has been within the last decade an enormous awakening of interest, largely resulting from the work of British scientists in the long-neglected study of grasses and grasslands. These researches have revealed properties of such high and rather unexpected nutritional and economic significance in many of the common grasses at an early stage of their growth, that grassland development has come to be one of the most profitable lines of enquiry in scientific agriculture. In our last issue we reproduced the concise summary of the rôle of the grasses in the evolution of animal life upon the earth's surface given by the eminent British geologist, Professor W. W. Watts, in his presidential address to the British Association.

At the same meeting an important discussion on the Chemistry of Grass Crops took place in the Section of Chemistry, when Professor A. C. Chibnall, of London, introduced the discussion with a critical account of the methods used by chemists in estimating the protein and other constituents of grass crops. He was followed by Mr. H. J. Page and Dr. S. J. Watson, of the I.C.I. Research Farm at Jealotts Hill.

Ousting the Hay-Stack

Protein content, digestibility, and carotene and vitamin content are all highest in young herbage and progressively decline with age. This is one very important reason why haymaking is a wasteful method of conserving the resources of grassland for winter use. The other is that the process of haymaking itself accounts for a further large loss of protein, and a wholesale destruction of vitamins and carotene. Hay is really nothing but roughage, with enough nutritive value for mere maintenance of an animal.

Two other methods were now being tried—that of silage and that of drying the grass. Both had already achieved marked success, and considerable further practical improvements were to be anticipated in the near future. The latest samples of dried grass prepared at Billingham retain their digestibility and their colour, together with nearly 90 per cent. of their carotene, thus allowing cows to produce milk giving yellow "summer" butter throughout the winter. The further application of accurate chemical methods was likely to effect further economies in rationing stock.

Professor Virtanen, the well-known expert from Finland and originator of the A.I.V. process of silage, in which mineral acids are added to the green crop in order to direct fermentation into desirable channels, mentioned numerous important advances which he and his school had established. One was the fact that leguminous plants could not only fix atmospheric nitrogen with the aid of their symbiotic bacteria, but excreted the surplus nitrogen in such quantities that the nitrogen excreted by one pea plant could entirely support two plants of oats. Another important fact was that, thought plants could themselves synthesise a certain amount of the vitamins and growth factors needed for healthy growth, the addition of further amounts might promote much better growth.

Professor Virtanen described the recent developments of the A.I.V. method of silage. Even in Finland a good clover field could be

cut three times in one season and conserved with very little loss for winter use.

Again, at the Imperial Botanical Conference, held in London on August 27th to 30th last, under the presidency of Sir Arthur Hill, an important section of the discussion was devoted to pasture research. In his address of welcome to members the President emphasised the ever-increasing importance of botanical research in the development of Imperial agricultural resources, not merely in regard to crops which figure in export trade, but also to the food plants of the native and his animals. The study of native crops with the view of obtaining maximum yields under the various local conditions is a work of the greatest national importance which calls for the continued co-operation of botanical and agricultural workers at home and overseas.

Improvement of Pastures

In the session devoted to Pasture Research at which some of the most distinguished workers in the Empire in this subject took part, Professor R. G. Stapledon (as reported in *Nature*, September 7th last), in introducing a series of papers on "Pasture Research Within the Empire," dealt with the importance of "strain" in pasture plants. Studies at Aberystwyth have abundantly shown that grassland plants are no exception to the general rule that botanical species contain within their ambit a more or less indefinite number of strains of varieties. Between the strains of a particular grass or clover there might be a greater difference in agricultural value, for example, permanence in the pasture, feeding value, economic return, etc.—than there is between desirable and undesirable species. These strains or groups of strains have been evolved on a geographical basis, partly in response to climatic and soil conditions, but probably to a large extent as a result of long-continued farming practices. The work of the plant breeder is in the first place to discover which are the most desirable of these local groups for special purposes, and then to ensure that in commercial exploitation any tendency to deterioration is effectively checked. The sowing out of pure strains is not desirable inasmuch as a certain degree of variability gives some insurance against the vagaries of climate and of farming practice. The maintenance of pure strains, with subsequent judicious blending, is a splendid ideal which is very difficult to achieve and is in fact not necessary. The difficulty of maintaining the quality of a certain group of strains ("ecogroup") is not so great as is sometimes imagined and can be overcome for all practical purposes if the work is carried out in a suitable locality and on a large enough scale. The essential point is to safeguard the quality of the original stock, and this can only be done under the direct control of the plant breeding station.

The problems involved in the improvement of pastures in the Dominions were outlined by Dr. I. B. Pole-Evans for the Union of South Africa, and by Professor G. W. Scarth and Mr. H. J. Whyte for eastern Canada. Dr. Pole-Evans described the natural pasture areas of the Union, and in this connection exhibited a comprehensive series of coloured plates illustrative of the South African flora. Much damage to natural pastures has already been done by indiscriminate grazing, by burning and by other mal-practices. This he ascribed to a general absence of fundamental knowledge relating to the problems of veld management. He reviewed the research work which has been carried out in the Union up to the present and stated that a national research programme has now been organised which will deal in particular with problems relating to the general decline in the carrying capacity of the veld due to faulty grazing methods. This programme will also aim at the building up of an organised animal industry based on the development of the natural pasture potentialities of the country.

In presenting the Canadian problems, Professor Scarth pointed out that the natural pastures of eastern Canada are at the moment the most important in the Dominion, inasmuch as they carry more than half of the total livestock. A striking feature is that though these pastures have never been ploughed, the significant part of the herbage consists of introduced European plants which have in course of time colonised these areas. The pastures are generally poor and the trend is towards further deterioration. A very comprehensive programme of research organised both on a Federal and on a State basis, is now being carried out, involving ecological mapping in association with soil surveys, manurial trials in relation to quantity of herbage and to stock rearing or milk production, biochemical studies of pasture plants, etc. The main result so far established is that the pastures as a rule respond markedly to the addition of phosphatic fertilisers, the poor type of *Agrostis* sward being replaced in time by the better grasses with clovers. The formulation of recommendations applicable to the different soils and climates will only be possible after vigorous research over many years. An ecological study of certain pastures of eastern Canada was presented by Mr. H. J. Whyte and served to illustrate the poor quality of many of these and the need for improvement.

Certain detailed aspects of pasture research in England were described by Mr. G. E. Blackman and by Mr. Martin Jones of the Jealotts Hill Research Station of Imperial Chemical Industries, Ltd. Mr. Blackman showed that under spring conditions, nitrogenous manuring stimulates growth within a certain temperature range only. During midseason, water supply rather than nitrogen is the controlling factor. The effect of light on the growth of pasture plants is complex, varying with the species, with the available nitrogen supply and even with the form in which the latter is added.

Mr. Martin Jones dealt with the competition to which the constituents of grassland are subjected by neighbouring plants and showed how differences in habit or rate of growth lead to the dominance of certain forms or the suppression of others. Grazing by animals is of the greatest importance in this connection, the effects on the development of any particular constituent varying according to the intensity of grazing at any given period. The correct management of grazing is therefore essential for the maintenance of any particular type of pasture.

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Errata.—Abstract "Gas Gangrene in the Horse" (Berge, E., and Meyn, A.) No. 37, Vol. xv. On page 1125, Col. 1, last line but one, for *Cl. chauvœi* read *Cl. septique.*

Page 1127. Conclusion (2) should read: It is slightly less resistant to *Cl. welchii*, but the organism is not capable of producing more than a mild and transient inflammation, *except in extremely severe wounds, as in the third naturally occurring case.*